COMPENDIUM OF RESEARCH 2000

SOCIAL, ECONOMIC AND TECHNICAL RESEARCH

CMHC SCHL

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INTRODUCTION

Canada Mortgage and Housing Corporation, the federal Government's housing agency, is responsible for administering the National Housing Act.

This legislation is designed to aid in the improvement of housing and living conditions in Canada. As a result, the Corporation has interests in all aspects of housing and urban growth and development.

Under Part IX of this Act, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research. CMHC therefore has a statutory responsibility to make widely available, information which may be useful in the improvement of housing and living conditions.

This Compendium of Research has been compiled to publicize and increase access to the research reports produced under research programs sponsored by the Corporation during 1999/2000. A few reports not included in the earlier compendiums have also been added.

ARRANGEMENT

The abstracts of completed research reports and publications are arranged by broad subject areas. A title index can be found at the end of the Compendium.

AVAILABILITY OF REPORTS

Most research reports are available from the Canadian Housing Information Centre.

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ADDRESSING SPECIAL HOUSING NEEDS IN FIRST NATION COMMUNITIES

In the 1991 Census, the rate of disability reported by Aboriginal adults was twice as high as that in the Canadian population as a whole. Specifically in the area of housing, the report on the Round Table on Disabilities in First Nations Housing in 1993 referred to a range of problems including a lack of alternative housing, the need to review policies to identify barriers to service provision, and the inappropriateness of prevailing barrier free home designs for Indian reserves.

"Completing the Circle", the Standing Committee report on Aboriginal people with disabilities talked of the need for co-operation and support at the community level if the problems of disabled Aboriginal people are to be addressed. The Department of Indian and Northern Development evaluation of their contribution to the National Strategy for the Integration of Persons with Disabilities found that lack of information is the most significant barrier to First Nations people in finding the help they need.

Using the findings of these initiatives as a framework, as well as the findings of the Home Adaptations for Seniors Independence evaluation, this study profiles specific on-reserve communities in Atlantic Canada, identifying how they are addressing the housing needs of their disabled members, and on the basis of this, developed strategies and mechanisms for such communities to do it effectively.

The report identified recommendations for action by stakeholder groups (Aboriginal organizations in partnership with government) and by individual First Nation communities themselves. It also provided an evaluation of the objectives of the project.

A common element among the recommendations is the need for First Nation disabled people to play a key role in all issues affecting them including: identifying needs, establishing criteria for assistance, making decisions, and being the advocating voice. Another common element is the need for First Nation communities to take a proactive planning approach to meet the special needs of disabled and elderly in their communities, incorporating their needs into the bigger picture of planning for the future of their communities.

The "Completing the Circle" report identified that there were major gaps and administrative problems in meeting the needs of disabled Aboriginals. This research confirmed that in Atlantic Canada First Nation communities there are still a number of problems related to these issues. In particular, this research found that there is concern about the inability, real or perceived, to access provincially funded programs to meet on-reserve needs and the uneven provision of basic support services across the communities.

Prepared by: Rural and Small Town Programme. David Bruce, Senior Associate and Tracey Weatherston, with John Higham and Judy Reid. Ottawa: Canada Mortgage and Housing Corporation, 1998.

AVAILABILITY : Canadian Housing Information Centre

CORE HOUSING NEED AMONG OFF-RESERVE INUIT, MÉTIS, STATUS AND NON-STATUS INDIANS IN CANADA

This study, based on the 1991 Aboriginal Peoples Survey (APS) and 1991 Census, explores housing need among Inuit, Métis, Status and Non-Status Indian peoples living off-reserve. It profiles the factors that influence the high levels of core housing need experienced by each individual Aboriginal group.

The report brings to light two key conclusions regarding the overall incidence of Aboriginal housing need off-reserve:

- a large proportion of Aboriginal households located in northerly, remote areas of the country occupy housing that is crowded, in need of major repair and lacking adequate bathroom facilities. These physical housing problems are most commonly experienced in Labrador, the northern Prairies and the Northwest Territories; and,
- Aboriginal households are especially likely to fall into core housing need - that is lacking access to housing that is adequate in condition, suitable in size and affordable - in a number of urban areas in Western Canada, most because they are dedicating high proportions of their income to shelter.

Prepared by Ark Research Associates, Ark Research Manager: Aron Spector. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: John Engeland. Ottawa: CMHC, 1998.
Order Number PE0295

NOTE : Aussi disponible en français sous le titre : Les besoins impérieux de logement des Inuit, Métis et Indiens inscrits et non inscrits vivant hors des réserves, au Canada, PF0295.

AVAILABILITY : CMHC Information Products

EVALUATION OF THE HOUSING INTERNSHIP INITIATIVE FOR FIRST NATIONS AND INUIT YOUTH (HIIFNIY)

This report is an evaluation of the Housing Internship Initiative for First Nations and Inuit Youth (HIIFNIY). HIIFNIY is a program funded under the federal government's Youth Employment and Strategy (YES), which is intended to assist young people in making school-to-work transitions. Human Resources Development Canada (HRDC) is the lead agency of the YES program, coordinating its efforts across all federal departments and agencies. Individual departments and agencies in turn implement a variety of related internship and employment programs. The HIIFNIY program, administered through CMHC, is one such program.

The objective of the HIIFNIY program is to aid the transition of Aboriginal and Inuit youth from school to employment and to improve participants' employability through the provision of housing-related work experience and on-the-job training. The program is targeted to Aboriginal youth living in First Nations and Inuit communities. As well as having these labour force objectives, the HIIFNIY also aims to increase the capacity of Aboriginal communities to manage and maintain good housing. The importance of the program was underlined by the conditions of high youth unemployment, and poor housing prominent in Canada's First Nations and Inuit communities.

This evaluation report provides an assessment of the HIIFNIY program as it operated in 1997-98 in all the Provinces and Territories. The purpose of the evaluation was to collect basic data on the operation of the HIIFNIY, and to provide an assessment of the program within Treasury Board guidelines of the Government of Canada.

Prepared by Maang Associates Inc. Ottawa: Audit and Evaluation Services, Canada Mortgage and Housing Corporation, 1999.

NOTE : Aussi disponible en français sous le titre : Évaluation de l'Initiative de stages en habitation pour les jeunes des Premières nations et les jeunes Inuit (ISHJPNJI)

AVAILABILITY : Canadian Housing Information Centre

PROPERTY INSURANCE ON-RESERVE: PRESENT ARRANGEMENTS, AND INNOVATIONS TO REDUCE THE COST: FINAL REPORT

The study is an examination of initiatives to reduce the cost of property insurance on-reserve. It considers property insurance on band-owned stock, and on houses owned by individuals whether through certificates of possession or other home ownership type tenures, to explore the ways different First Nations across the country are approaching the matter of obtaining property insurance. A survey of 116 First Nations was completed. The paper documents how First Nations presently go about arranging insurance, and identifies some of the innovations underway at the community, regional and national level to help reduce the cost. Advice to First Nations to assist in getting better and lower cost property insurance has been provided.

Prepared by Tony Wellman. Survey conducted by BomCor Associates. CMHC Project Officer: Vernon S. Barkwell. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program) 44 pages.

AVAILABILITY : Canadian Housing Information Centre

RISK MANAGEMENT AND INSURANCE IN ABORIGINAL COMMUNITIES: TWO CASE STUDIES

The cost of insurance is often three times higher in Aboriginal communities than in comparable non-Aboriginal communities. Previous research has shown that less than half of this extra cost can be justified because of the extra risks involved. This report describes two examples of Aboriginal communities who reduced the costs of their insurance through applying a risk management approach and competitive tendering. The 14 Inuit communities of the Kativik Regional Government in Nunavik achieved a decrease of 50% in cost, followed by a further reduction of 20% two years later. The scope of the coverage was improved with the same broker and insurance company as before. The Naskapi Band of Quebec took the same approach. It saved some 70% on the cost of insurance, while improving the quality of its coverage. Here the broker and insurance company changed. Risk management is a continuous and systematic series of activities with three distinct goals: to minimize the likelihood of accidents, to limit their severity, and to ensure that the pre-accident situation can be restored.

Ottawa: Canada Mortgage and Housing Corporation, 1999. 16 pages.

NOTE: Also published in English under the title: Risk Management and Insurance in Aboriginal Communities: Two Case Studies.

AVAILABILITY : Canadian Housing Information Centre

IMPACT DU BRUIT INDUSTRIEL SUR LES SECTEURS RÉSIDENTIELS ENVIRONNANTS: PORTRAIT DE LA SITUATION POUR LA BEAUCE ET POUR LA RÉGION DE QUÉBEC, ANALYSE DES LOCALISATIONS PROBLÉMATIQUES ET RECOMMANDATIONS

Residential sectors can be adjacent to sectors that are classified as commercial or industrial but, in many cases, the two functions are not compatible, whether on account of intense trucking activity, sporadic noise throughout the day or even continuous noise that can last well into the night. There are many complaints in this regard, in both urban and rural areas. Planners and legislators are generally powerless to resolve this issue. In existing conflict situations, both functions are well within their rights, that is, residents can demand peace and tranquillity, while industrialists can expect to work and operate their companies, without having any new constraints imposed on them. As for potential situations, in the case of new residential developments, for example, there is not always an in-depth environmental analysis, or else, the pressure from developers wins out over the viewpoints of planners and environmentalists.

In this context, the research project proposed to establish the situation regarding the impact of industrial noise using as its laboratory the Québec and Beauce areas, two areas that comprise numerous industrial parks adjacent to residential sectors. The Beauce area, in addition to its very active industries, has a topography that is conducive to the concentration of urbanization and human activities. The principal objectives of the project were as follows:

- establish the scope of the problem of the impact of industrial noise on the closest residential sectors;
- measure and map the noise in the residential sectors deemed the most critical (with special consideration given to industries operating 24 hours a day);
- verify the causes of the situations analyzed (uncontrolled growth of residential developments, poor industrial planning or indifference of the industrial sector);
- identify the provincial and municipal legislative situation;
- analyze the possible mitigating actions (in particular, using computer modelling), such as reducing or controlling the level of noise at the source, or introducing protective measures, which could potentially include landscaping; and, finally,
- compile the results in a regional perspective, for both the survey of the situation and the recommendations.

Among all the industrial zones and parks visited, 15 sites were retained and analyzed in the Beauce area and 27 in the greater Québec area. The research project made it possible to document and clarify an often neglected aspect of residential environment quality and also to propose a few avenues for more sustainable solutions, to the attention of planners, industrialists, municipalities, and even developers.

Prepared by Jean-Gabriel Migneron, Pierre Côté, Wu Weixion. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

RÉDUCTION DU BRUIT PRODUIT PAR LES PORTES DE GARAGES

This study concerns the noise transmitted into multiple housing project living quarters located above the garage entrance at the time of opening and closing the doors installed at this entrance. The report presents the levels of noise transmitted to the living quarters during the operation of the 15 garage doors tested and the installation conditions of each door (wood or concrete construction, mechanically or manually operated door, jamb and mechanism cushioned or not, etc.), as well as ways to reduce the noise transmitted by 7 to 13 dB depending on the installation conditions.

Prepared by Michel Morin, MJB Conseillers en Acoustique inc. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 1994 (i.e. 1999) (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

SOUND AND FIRE PERFORMANCE OF FIRE STOPS IN MULTI-FAMILY DWELLINGS: FLANKING TRANSMISSION AT JOINTS IN MULTI-FAMILY DWELLINGS: PHASE I: TRANSMISSION VIA FIRE STOPS

Fire stops can introduce a physical connection between the two sides of a double-stud wall, hence providing structural flanking paths for transmission of vibration which worsens the sound insulation.

This study primarily addressed the specific case of a load-bearing party wall with double wood studs, supporting a floor with wood joists perpendicular to the party wall and a floor deck or sub-floor of 15.9 mm OSB.

Even without structural transmission of vibration through a fire stop, the sound insulation in a real building is normally affected by flanking transmission.

Addition of a fire stop provides yet another path for vibration transmission between the rooms, and hence tends to worsen the sound insulation further. This study examines how a fire stop at the floor/wall junction can degrade the apparent sound insulation of the party wall (the nominal separation) by increasing structural transmission of vibration around that wall via the connected floor system (the flanking path).

Prepared by T.R.T. Nightingale, R.E. Halliwell, Institute for Research in Construction, National Research Council. Prepared for: Canada Mortgage and Housing Corporation ... et al. CMHC Project Officer: Jacques Rousseau. Ottawa: CMHC, 1997.

AVAILABILITY : Canadian Housing Information Centre

BASEMENT WALLS THAT DRY: FINAL PROJECT REPORT

An eighteen month study was undertaken to evaluate the abilities of 10 basement wall insulation/framing options to dry after being subjected to either a controlled leak or a short term flood. Conventional wood framed construction, steel stud construction and three proprietary systems were evaluated. The proprietary systems included a new product from Owens Corning which is a vinyl faced rigid fibreglass system which can be installed without wood or steel framing, an extruded polystyrene insulation system, Perimate from Dow and a sprayed in place polyurethane insulation. Five variations of conventional wood stud framing were evaluated. The differences evaluated ranged from the use of an external moisture barrier to standing the framing off walls and floors to the use of Densglas as an alternative to gypsum board. The two steel stud systems tested varied only in stand off from the basement wall.

In general all of the proprietary wall systems performed better that the wood framed or steel stud systems. The systems either did not absorb significant amounts of moisture or dried relatively rapidly after wetting. This was observed whether the moisture source was a controlled leak or a short term flood.

The steel stud stystems performed better than their wood framed counterparts when subjected to a short term flood. The steel studs, having no capability to retain moisture, dried out more quickly than the wood systems.

Of the wood framed systems tested none appeared superior in both cases; controlled leak or flood. In the case of a controlled leak, such as might occur in the event of a crack in a basement wall, the systems that had an external moisture barrier caused the water to flow down the wall, under the bottom plate and into the basement. Because such system systems were never really wetted they appeared to offer superior performance. When the source of the moisture was a flood the opposite appeared to be true. It was not possible to "seal" the panels, nor was any real attempt made to do so. When standing in 100 mm of water during a "flood" the liquid found its way into all panels, regardless of whether a moisture barrier was present. Once in the panel the moisture remained longer in panels equipped with a moisture barrier. In other words the moisture barrier inhibited moisture removal.

Aside from some darkening in the bottom plate of two of the wood framed panels the study was unsuccessful in producing significant growth of mold or mildew. Conditions were generally favourable; surface moisture and wood moisture contents in excess of 25% for months but no infestations occurred. This may be due to the lack of spores which must be present to initiate growth.

Prepared by Tom W. Forest and Mark Y. Ackerman. Ottawa: Canada Mortgage and Housing Corporation, 1999.

NOTE : Aussi disponible en français sous le titre: Séchage des murs de sous-sol

AVAILABILITY : Canadian Housing Information Centre

AUSTRALIAN BUILDING REGULATION AND LIABILITY REFORMS

The Commonwealth Government of Australia and individual Australian states have introduced reforms to the regulatory environment in order to reduce costs and barriers associated with development and construction. Some of the reforms include a transition to objective based building codes, the introduction of compulsory job-specific warranty-type insurance programs, limitations on liability for building practitioners, privatization of building approvals and inspections and compulsory registration of building professionals. This project documents the reforms implemented in the State of Victoria based on a review of documentation and regulations and interviews with key actors. The status of similar reforms in other states and territories is reported. The report provides a context for the discussion of the applicability of the Australian building regulation and liability reforms in Canada.

Prepared for Canadian Home Builders' Association and Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999. (Healthy Housing and Communities Series Research Report) 37 pages.

Order number: PE0380

NOTE : Aussi disponible en français sous le titre : Réformes de la réglementation australienne de la construction et des dispositions en matière de responsabilité

AVAILABILITY : CMHC Information Products

BUILDING MATERIALS

CHALLENGES AND PROSPECTS FOR THE BUILDING MATERIALS INDUSTRY IN CANADA

This study provides insight into factors that influence Canada's building materials industry and specific sub-industries (gypsum wallboard; plumbing fixtures and fittings; windows and doors; roofing; insulation; heating and air conditioning; exterior cladding; flooring; concrete products; wood products), and the challenges and prospects faced. The findings are based on an extensive consultation process undertaken in 1997 with industry representatives and a review of other information on industry trends and prospects.

Prepared by Greg Lampert, David Redmond, Michael Lio, Linden Holmen, Bob Sheehan. Prepared for Canada Mortgage and Housing Corporation and Canadian Home Builders Association. Ottawa: Canada Mortgage and Housing Corporation, 2000, c1998. (Housing Affordability and Finance Series; Research Report)

Order number: PE0397

NOTE: Aussi disponible en français sous le titre : Défis et perspectives du secteur canadien des matériaux de construction

AVAILABILITY : CMHC Information Products

CONSTRUCTION EN BLOCS DE TERRE COMPRIMÉE

The objectives of this project were to:

1- Assess whether Quebec soils are adequate for compressed earth block construction (CEB);

2- Evaluate the thermal & compression properties of selected earth mixtures from near Montreal; and

3 - Simulate CEB wall durability under Quebec winter conditions.

The work undertaken included the following:

1- Soil samples were studied from within a radius of 150 km around Montréal. Thirteen earth samples were brought to the University of Sherbrooke to analyze these soils.

2- Three of these soils were chosen to make compressed earth blocks. With the help of ENTPE (Ecole national de travaux publics de l'Etat, in Lyons, France) five groups of 20 blocks were made from these three soils. Once the curing and drying were completed, these blocks were transported to Concordia University in Montreal for thermal and compression tests.

3- With this data, compressed earth block walls were simulated using the "EMPTIED" software to assess whether these walls would survive harsh winter conditions. Three CEB wall designs were judged to be suitable. (EMPTIED = Envelope Moisture Performance Through Infiltration Exfiltration and Diffusion).

This research will enable architects, contractors and self-builders, to consider the use of this material for construction in northern climates.

Prepared by Ginette Dupuy. CMHC Project Officer: Chris Ives. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

FINAL REPORT FOR ADJUST-A-FORM TESTING

The purpose of this project was to determine the effectiveness of the Adjust-a-Form system for use as a continuous footing. Adjust-a-Form, a reusable adjustable forming system, was originally conceived to improve the line and level of continuous footings, particularly in the residential construction industry. Results of this study demonstrated that Adjust-a-Form improves the line and level of residential footings and saves time and money in the construction. Reluctance within the industry to use this system is attributed to the high initial capital cost, even though it is demonstrated that the amortized cost is lower than for conventional wood forms.

Prepared by Albert Schepers for Tony Azar, Raymax Construction Ltd. Ottawa: Canada Mortgage and Housing Corporation, 1999. (Housing Technology Incentives Program)

AVAILABILITY : **Available for loan only from:**
Canadian Housing Information Centre

HOW TO READ A MATERIAL SAFETY DATA SHEET (MSDS): ABOUT YOUR HOUSE; CE 18

This fact sheet describes the sections of a typical Material Safety Data Sheet (MSDS) and explains the Workplace Hazardous Materials Information System. The fact sheet gives reasons for wanting to use MSDS's and how to obtain them. Other information sources for chemical ingredients are provided as well as useful web sites.

Ottawa: Canada Mortgage and Housing Corporation, 1999. 4 pages

Note: Aussi disponible en français sous le titre : Comment déchiffrer une fiche technique sur la sécurité des substances (FTSS)

AVAILABILITY : Canadian Housing Information Centre

MACROECONOMIC IMPACT OF THE BUILDING MATERIALS INDUSTRY IN CANADA

Using input-output (I-O) data and a well-known macroeconomics model of the Canadian economy, this study estimates the economic impact of the Canadian building materials industry in terms of national income and employment for the years 1995 and 1989. The study covers sub-industries producing:

- gypsum, wallboard and accessories;
- plumbing fixtures and fittings;
- windows and doors;
- roofing;
- insulation and air barriers;
- heating and air conditioning systems;
- exterior cladding;
- flooring;
- concrete products;
- ready-to-use lumber;
- paints and related products;
- textile floor coverings;
- kitchen cabinets; and
- floor and wall coverings, excluding vinyl.

For each sub-industry, impacts are broken down into:

- direct impacts, occurring within the sub-industry itself;
- indirect impacts, occurring in industries that supply the sub-industry with raw materials and other inputs; and
- induced impacts, generated throughout the economy as households spend income earned as a result of direct and indirect impacts.

Prepared by Geoff Bromfield, Martha Justus, Keith May, Informetrica Limited. Ottawa: Canada Mortgage and Housing Corporation, 1999. (Housing Affordability and Finance Series: Research Report)

Order number: PE0325

Aussi disponible en français sous le titre : Répercussions macroéconomiques de l'industrie de matériaux de construction au Canada, PF0325.

AVAILABILITY : CMHC Information Products

GRANVILLE ISLAND: AN URBAN OASIS

Twenty years ago, Granville Island was transformed from a decrepit 37-acre industrial slum in Vancouver's False Creek to possibly the most successful urban redevelopment ever seen in North America. Rusty tin-sided factories were reborn as a public market, an art school, shops, restaurants, theatres, and a great deal more. Today, Granville Island boasts more than eight million visits a year, 2,600 jobs and the highest sales per square foot of any public market on this continent.

This book chronicles the Granville Island story, celebrates what the Island has to offer, and peers inside its seldom-seen inner life. It describes the Island's heritage, its transformation, attractions and amenities and its working life.

Prepared by Michael McCullough. Vancouver : Granville Island Office, Canada Mortgage and Housing Corporation, 1998.

*** Price: $39.95 + GST and handling charges.*

AVAILABILITY : Granville Island Office
Canada Mortgage and Housing Corporation
1661 Duranleau St., 2nd Floor
Vancouver, BC
V6H 2S3
Tel.: 604-666-6655
Tel: 604-666-7376

PROGRAMME ÉCO-QUARTIER DE LA VILLE DE MONTRÉAL: UNE INNOVATION EN ÉVOLUTION

The Éco-quartier program was organized by the City of Montreal to involve its citizens in locally-based environmental initiatives. The purpose of this report is to evaluate the program so that readers from Montreal and all municipalities across Canada can benefit from lessons learned.

This innovative program responds to local environmental needs, most particularly collecting recyclable materials and greening the city. However, it has not addressed large-scale environmental problems such air pollution. In this regard, it has been more focused on issues that directly affect local citizens. Thus the mandate or scope has been somewhat limited.

Regarding its greening the city activities, a horticultural approach has been favoured over an ecological approach, i.e. beautification over biodiversification. Interviews reveal that participation in the activities by citizens has been weak on the design and maintenance of the planted sites, but that local citizens enjoy the initiatives and feel that they fill a social need.

To improve the program, the organizers should involve residents in all phases of the projects, favour use of public spaces over private lots, and make better use of partnerships. They should also expand the program to address other local environmental issues.

Prepared by Gilles Sénécal and Diane Saint-Laurent with the collaboration of Anne-Marie Charlebois and Daniel Léonard. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

DEVELOPMENT OF A NEW EDITION OF THE STANDARD FOR CONCRETE CONSTRUCTION FOR HOUSING AND SMALL BUILDINGS (CSA A438)

The purpose of this project was: Ÿ to carry out a review of the literature pertaining to current failures of concrete in residential basements, specifically addressing the high incidence of foundation wall cracking and water penetration.Ÿ to determine how the delivered ready-mix might be improved in crack-resistance and how on-site concreting practices might be remedied; andŸ to bring standard A438 into line with the requirements of the 1994 edition of CSA 23.1 Standard Concrete Materials and Construction.The Canadian Standards Association (CSA), with CMHC and industry support, has redrafted the standard CAN3-A438-M84: Concrete Construction for Housing and Small Buildings. This standard addresses requirements for poured-in-place concrete basements. The new standard is available from CSA.

AVAILABILITY : CSA International
178 Rexdale Boulevard
Etobicoke (Toronto), ON
M9W 1R3
Tel: (416) 747-4000
e-mail: sales@csa-international.org
In U.S. and Canada, call toll free 1-800- 463-6727

DOORS AND WINDOWS

CONCEPTION DE JOINTS DURABLES ENTRE LES FENÊTRES ET LES MURS

This study aimed at finding ways of designing wall/windows joints with increased durability. It took into consideration environmental factors contributing to the deterioration of the joints, different materials incorporated in the window structure, various types of structures, building envelopes, and exterior siding, and different materials which can be used in the joints themselves. The research project included development of construction details, theoretical assessment of the performance of different solution details, definition of test procedures, and laboratory tests on a typical detail. A methodology for designing the joints is included in the report.

Prepared by Air-Ins Inc. and Groupe Petrone. CMHC Project Officer: Jacques Rousseau. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

INFLUENCE DE L'INFILTRATION D'AIR SUR LE RENDEMENT ÉNERGÉTIQUE DES FENÊTRES RÉSIDENTIELLES

There is a Canadian standard to evaluate the energy efficiency of residential windows. This energy efficiency depends on three factors: the thermal resistance of the window; the air infiltration through the frame; and solar gains. This report presents the results of a study aimed at verifying the influence of air filtration.

A new method is proposed to take into account the interaction between the air that comes in and the frame. On the basis of standardized infiltration tests and computerized meteorological files, the real infiltration flows are calculated, taking into account the exterior temperature and the wind speed. As well, the increase in the infiltration flow at low temperatures, caused by the contraction of the frame, is also taken into account. Based on the different infiltration flows calculated, a mathematical model simulating the behaviour of the window is used to quantify the interaction between the air that comes in and the frame.

Two sizes of windows and two types of frames (all PVC aluminum with PVC thermal break) were examined. The results are presented for five Canadian cities: Montreal, Toronto, Winnipeg, Edmonton and Vancouver.

This study revealed that, for the windows examined, the thermal resistance of the frame is greatly affected by air infiltration. In addition, the evaluation of the energy efficiency by the proposed method differs from that calculated using the current Canadian standard. This difference is due to the use of different meteorological files and the fact that the standard does not take into account the interaction between the frame and the air that comes in.

Prepared by Michael Bernier and Stéphane Hallé. CMHC Project Officer: Ken Ruest. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

ENERGY CONSERVATION

COMMUNITY ENERGY MANAGEMENT - FOUNDATION PAPER

Following the recent Kyoto summit on climate change, the federal government established fifteen "Issue/Sector Tables" to examine the costs and impacts of implementing Canada's greenhouse gas reduction targets. CMHC is a member of the "Municipalities Table" and co-chairs the subcommittee on "Community Energy Planning" (reporting to the Municipalities Table). CMHC recently funded the development of this Foundation Paper on Community Energy Planning.

This paper explores the potential for community energy planning to contribute to the reduction of greenhouse gas emissions in Canada. The discussion begins by defining Community Energy Management (CEM) and its role in achieving larger community goals such as reducing public sector expenditures, job creation and improving the quality of life. This discussion is in the context of the level and pattern of energy use in Canadian communities, particularly the portion that is subject to the influence of CEM initiatives. Two aspects of CEM are examined in some detail: the relationship between land use and energy use, and the potential for district energy systems in Canadian communities.

Prepared by Torrie Smith Associates. Prepared for David D'Amour (CMHC), Co-chairman, Community Energy Planning Subcommittee, Municipalities Table, National Climate Change Process. Ottawa: Canada Mortgage and Housing Corporation, c2000. (Healthy Housing and Communities Series Research Report) v, 33 pages

Order number: PE0354

NOTE : Aussi disponible en français sous le titre : Gestion communautaire de l'énergie : Document de base.

AVAILABILITY : CMHC Information Products

CORRIDOR AIR VENTILATION SYSTEM ENERGY USE IN MULTI-UNIT RESIDENTIAL BUILDINGS

Canada Mortgage and Housing Corporation (CMHC) funded this study to expand knowledge about the energy impact of operating ventilation systems that pressurize corridors in multi-unit residential buildings (MURBs). In the winter of 1997/98, a field test protocol to assess the impact of corridor ventilation system operation was developed and tested on a MURB. Building energy use was monitored with the corridor ventilation system operating one winter night and off the following night. This process was repeated over a range of temperatures. The tests provided real data on the energy impact of operating corridor ventilation systems. Monitoring data were compared with predictions from a computer model. The computer model proved not to be a useful tool for assessing the impacts of corridor ventilation on infiltration or building energy use. In the winter of 1998/99, the field protocol was tested on another four buildings to assess its applicability to buildings with different energy systems.

Data analysis focused on time periods between midnight and early morning, when the impacts of solar gains and day-to-day variation in DHW loads and occupant activities (cooking, cleaning, clothes drying, weekends, holidays, etc.) were assumed to be minimized. Linear regression was applied to each data set (i.e., the fans-on data and the fans-off data) to mathematically define the relationships between outdoor temperature and energy use in each building.

The field protocol was relatively straightforward and inexpensive to apply and could be done without use of expensive or high-tech monitoring equipment. The data analyses, done in a spreadsheet computer program, showed very good correlation between outdoor temperature and whole-building energy use and distinct relationships for the "fan on" and "fan off" operating condition. Observations made on the five study buildings were sufficiently similar to allow for general conclusions to be drawn about the impact of operating corridor ventilation systems on building energy use and whole-building air change rates.

The observed increase in whole building energy use when the corridor ventilation systems were operated in the study buildings ranged from 60 to 90% of energy that would be required to condition the corridor ventilation system air flow. This energy increase was much bigger than expected, based on a fundamental analysis of the buildings. This leads to the conclusion that operating corridor ventilation systems does not appreciably increase indoor-to-outdoor pressure differentials across suite walls so does not displace significant amounts of infiltration.

Turning the corridor ventilation system off did not result in complaints about air quality during cold weather, but did when temperatures were above freezing. As such, turning corridor ventilation systems off may be an effective strategy for reducing energy consumption and peak energy demand during very cold weather.

Prepared by Bert Phillips, Unies Ltd. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Duncan Hill. Ottawa: CMHC, 1999.

AVAILABILITY : Canadian Housing Information Centre

IMPACT OF ADDED INSULATION ON AIR LEAKAGE PATTERNS

The objectives of this project were: 1. To test a method of characterizing air exfiltration, experimentally and analytically. 2. To determine the impact of two insulation strategies - from inside and from outside - on the dispersal of exfiltrating air through various types of joints.

Adding insulation to exterior walls may worsen the original wall performance. Depending on the amount and geometry of air leakage in the original wall, added insulation may actually increase the potential for condensation, letting water accumulate in the wood structure and leading to rot.

An experiment was set up to compare the performance of different leaky walls and to investigate their behaviour with insulation added on one side or other of the wood studs. The experiment also maps the path of air leakage. The test conditions represented winter and late spring weather in Montreal.

It was found that the first measure to be considered remains the sealing and air tightening of the existing walls, with special care given to junctions and to punctures. If not sealed, leaky walls were found to accumulate moisture, especially when insulated on the outside.

Research Team: Dominique Derome, Paul Fazio, Guylaine Desmarais. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 2000 (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

MÉTHODE D'ESTIMATION ÉNERGÉTIQUE DES BÂTIMENTS D'HABITATION BASÉE SUR L'APPLICATION DE L'INTELLIGENCE ARTIFICIELLE

The objective of this project was to develop a rapid method of estimating energy use in highrise residential buildings, by the application of artificial intelligence. The method gives a variety of results, such as total energy consumption, power load, heat and cooling consumption, and takes into consideration such variables as apartment orientation, occupancy schedules, and the interaction of HVAC and envelope systems.

The work consisted of:

- Creation of data bases which classify the parameters of the energy simulations, modeling and validation of the results using DOE-2;
- Application of neural networks including training and validation of the results;
- Development of the simulation for residential buildings; and
- Validation of the simulation program.

The program at this stage has been developed for climatic conditions similar to Ottawa, which will be expanded at a later stage. It was tested to verify its accuracy using a previously monitored Ottawa highrise. It provides the total building energy consumption as well as the use by apartments, corridors and parking, with the power loads. The data entry and results interfaces can be modified as well. The program was developed using the MatLab environment: for a larger application, the program would need to be translated into C++ language.

Prepared by Stanislaw Kajl and Marc-Antoine Roberge. CMHC Project Manager: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

VENTILATION IN 2 OR 3 UNIT MULTI-FAMILY BUILDINGS BEFORE AND AFTER WEATHERIZATION

Older multifamily buildings offer a great opportunity for energy savings because they are poorly insulated and are not airtight. These buildings often have no mechanical ventilation system and rely on the air leakage through the exterior envelope to provide an adequate supply of outdoor air. Sealing measures can greatly reduce the equivalent leakage area of the exterior shell and change the location of the neutral pressure plane. This has a major impact on the outdoor air supply and how it is distributed on a unit-per-unit basis.

This study investigates the outdoor air supply of a 2-unit multifamily building before and after weatherization and evaluates the effectiveness of exhaust only ventilation in weatherized buildings. Air flow was simulated with CONTAM, a software developed by the National Institute of Standards and Technology (NIST) and the case study building is typical of the buildings targeted by recent weatherization programs performed in Quebec.

The results show that outdoor air supply due to infiltration depends on the location of the unit and its degree of connectivity with the adjacent unit. For buildings whose units are relatively well connected to each other, the results show that the fresh air change rate of the top unit due to infiltration is negligible prior to weatherization and that weatherization of the roof space significantly reduces inter-zonal leakage. The results also showed that exhaust fans are ineffective in increasing outdoor air supply to the top unit of such buildings. Possible solutions include the installation of a balanced mechanical ventilation system or performing sealing works to increase the airtightness between the units. For buildings whose units are relatively isolated from one another, the results showed that exhaust-only ventilation is an effective means of providing outdoor air, especially during mild outdoor temperatures.

The findings presented herein contribute to our knowledge of ventilation issues with respect to a segment of the existing building stock which is most likely to be targeted for energy retrofits and weatherization programs in the near future. The results also shed light on the effectiveness of exhaust only ventilation as a means to increase fresh air supply to occupants.

Determining the ventilation needs of multifamily buildings, regardless of weatherization, is a complex task. Within the scope of a weatherization program, it is important to establish an airtightness testing method which quantifies both the shell and inter-zonal leakage and to adopt a computer program which can simulate the fresh air distribution for a given design day or hourly weather profile.

Prepared by Dino Gerbasi, Siricont. CMHC Project Officer: Duncan Hill. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

COSTS AND BENEFITS TO MUNICIPALITIES OF MANDATORY RESIDENTIAL FIRE SPRINKLERS: SUMMARY REPORT

This report presents the results of a study to assess, from an economic perspective, the costs and benefits to municipalities of the mandatory installation of fire sprinklers in all new residential construction. The study was commissioned by Canada Mortgage and Housing Corporation (CMHC), with the participation of the Ontario Ministry of Municipal Affairs and Housing, and the Office of the Ontario Fire Marshal. The National Research Council and Federation of Canadian Municipalities were also involved in the project. In Phase 1, the economic model was developed and tested using data collected from two Ontario case study municipalities, Barrie and Burlington. Subsequently, in Phase 2, revisions to the method and economic model were made and four additional case studies were carried out. The Phase 2 case study municipalities were Edmonton, Alberta; Pitt Meadows, British Columbia; Gatineau, Quebec; and Kawacatoose First Nation, Saskatchewan.

The study examines the benefits and costs of automatic sprinklers and estimates the effect of mandatory sprinklers on the cost of providing municipal fire protection services. The study also identifies the impact of sprinklers on the cost of housing development, construction and maintenance. Municipal costs, such as potential changes in municipal infrastructure, municipal insurance premiums and fire department facilities and operations, have been considered. Development costs, such as the direct provision of infrastructure or the payment of development charges, are examined. Direct construction costs, such as the installation of the sprinkler system, and ongoing operating and maintenance costs for the homeowner, are also identified.

Prepared by: Arencon Inc. with the assistance of Clayton Research Associates Limited, Graham Harmsworth Lai & Associates Ltd., and J.G. Henderson & Associates. CMHC Project Managers: Tom Kerwin, Mark Holzman, Nicole Parent. Ottawa: Canada Mortgage and Housing Corporation, 1999, c1998. (Housing Affordability and Finance Series Research Report)

Order number: PE0314

Aussi disponible en français sous le titre : L'installation obligatoire d'extincteurs automatiques à eau dans les habitations coûts et avantages pour les municipalités.

AVAILABILITY : CMHC Information Products

FIRE RESISTANCE TESTS ON FULL-SCALE FLOOR ASSEMBLIES

This report presents the results of 32 standard fire resistance tests conducted on full-scale floor assemblies as part of the collaborative industry-government research program investigating the effects on the fire resistance of lightweight floor assemblies of subfloor material, gypsum board screw spacing from board edges, wood-I-joist type, method of fastening the gypsum board butt ends, insulation type, number of gypsum board layers, joist spacing, resilient channel spacing, addition of concrete topping, steel/concrete composite systems and structural load.

Prepared by: M.A. Sultan, Y.P. Seguin, P. Leroux, Institute for Research in Construction, National Research Council. Prepared for Boise Cascade Corporation, Canada Mortgage and Housing Corporation, Canadian Home Builders' Association ... et al. CMHC Project Officer: Jacques Rousseau. Ottawa: CMHC, 1998.

AVAILABILITY : Canadian Housing Information Centre

IMPACT ON LIFE RISK OF MANDATORY SPRINKLERS IN RESIDENTIAL BUILDINS

The fire risk assessment model, developed by the National Research Council of Canada (NRC), was used to assess whether an apartment building with sprinkler protection but with increased fire department response time provides a level of fire safety for the occupants equivalent to that in a building without sprinkler protection but with the current fire department response time. The NRC model is called FiRECAM™ (Fire Risk Evaluation and Cost Assessment Model). The model assesses the expected risk to life and the fire costs in a building based on the dynamic interaction of fire and smoke spread, occupant evacuation and fire department response.

In this study, a 3-storey apartment building is used as a representative building in a new development area of a municipality, where buildings may range from a single family house to a medium-rise apartment building. The expected risk to life to the occupants is assessed with and without added sprinkler protection and with two levels of fire department response: with and without new fire stations.

New development areas in five cities are used in this study. They are Barrie and Burlington in Ontario; Pitt Meadows, B.C.; Edmonton, Alberta; and Gatineau, Quebec. In each municipality, the response times of the fire department are calculated using existing fire stations and added new stations. Future stations were previously determined by the municipal fire departments to meet protection needs for projected populations. In addition, the impact of mandatory sprinklers in an existing First Nations Community, Kawacatoose in Saskatchewan, is also assessed.

The results of this study show that, using a 3-storey apartment building as a model building, the provision of sprinkler protection and a longer than normal fire department response time (i.e. no new fire stations) provides a level of fire safety better than the case without sprinkler protection but with a normal fire department response time (i.e. with new fire stations). Based on similarity considerations in fire and smoke spread and occupant evacuation between single family houses and apartment buildings, the impacts of mandatory sprinklers on the expected risk to life, obtained for 3-storey apartment buildings, are argued to be applicable to single family houses.

Prepared by D. Yung, G.V. Hadjisophocleous, N. Benichou and Q. Liu. Prepared for Canada Mortgage and Housing Corporation. Ottawa: Institute for Research in Construction, National Research Council Canada, 1999.

AVAILABILITY : Institute for Research in Construction
National Research Council Canada
1500 Montreal Road
Ottawa, Ontario
K1A 0R6

SOUND AND FIRE PERFORMANCE OF FIRE STOPS IN MULTI-FAMILY DWELLINGS: FIRE SPREAD IN WALL-FLOOR JOINTS OF MULTI-FAMILY DWELLINGS

This report presents the results of 3 full-scale tests conducted at the Institute for Research in Construction, National Research Council of Canada on double stud party wall/floor joints. The assemblies were tested in a floor furnace using the CAN/ULC-S101-M89 temperature-time relationship. This study was part of a joint research project on the fire and sound flanking at the wall/floor joints in double stud wall assemblies.

Assemblies No. 1 and No. 2 were tested with various fire stop materials: semi-rigid glass and rock fibre insulation boards, sheet steel and Oriented Strand Board (OSB) placed between the joist headers, to investigate whether these materials will prevent flame spread into the upper storey cavity between studs for 15 min. Assembly No. 3 was tested, with no fire stop material in the space between the joist headers, to investigate the effect of the width of the vertical air space (12.7 mm, 25.4 mm and 38.1mm) between insulated double-stud frames on flame spread to the upper storey cavity between studs.

Prepared by: M.A. Sultan, Y.P. Seguin, P. Leroux, Institute for Research in Construction, National Research Council. Prepared for Canada Mortgage and Housing Corporation ... et al. CMHC Project Officer: Jacques Rousseau. Ottawa: CMHC, 1997.

AVAILABILITY : Canadian Housing Information Centre

FLOODS

JULY 1996 SAGUENAY DISASTER: IMPACTS ON REDEFINING THE HABITAT

The intent of this research is to allow one to appreciate, based on a target population in the Saguenay region, the consequences of a natural disaster in the design of one's home and the role this plays in the various stages disaster victims go through when they are required to relocate involuntarily. In more specific terms, this research attempts to answer the following questions:

- What were the residential itineraries of families which were uprooted against their will as a result of the floods of July 1996?
- What modifications did those who were involuntarily located make to their homes?
- What mechanisms did these people resort to in order to integrate into their new communities?
- What decision-making strategies could be used to take into account the needs and the living experience of relocated persons?

The research strategy takes a qualitative approach which involves interviews with about forty persons or couples who lost their homes and all their personal possessions during the floods of July 1996. Two verification instruments are used to explain what has been observed - semi-directed interviews and fact sheets. The answers to the questions asked produced the following findings. In addition to the physical and psychological effects of the direct consequences of the disaster and the numerous related difficulties, several aspects of the victims' personal, family, professional and social lives changed - (a) residential itineraries (most victims relocated three or four times before taking up their current residence) were a source of major tension; (b) integration into new neighbourhoods was mainly achieved with the participation of family and friends, and the new neighbours were often left out of the process. According to the disaster victims, living in a new neighbourhood means a break or even mourning, e.g. "A separation from friends, the loss of a feeling of security, changes in lifestyle, financial constraints, etc.; (c) the loss of "this paradise (...) this great corner of the world" elicits a new definition of the housing which is marked by images or representations that are negative (feeling of strangeness, nostalgia, indebtedness, sentimental losses, etc.); (d) finally, disaster victims have some suggestions to pass on to others who suffer a similar fate to inform and guide them. They suggest that victims take a step back before they make any important decisions. If volunteers are required at all times to display an understanding and generous attitude, the various levels of government should reduce bureaucratic and administrative requirements. Another suggestion offered by disaster victims was to extend the period during which financial and psychological help would be provided.

Prepared by Danielle Maltais, Suzie Robichaud. CMHC Project Officer: Marcel Boily.
Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

NOTE : Aussi disponible en français sous le titre : Le sinistre de juillet 1996 au Saguenay : conséquences sur la redéfinition de l'habitat

AVAILABILITY : Canadian Housing Information Centre

HEATING AND VENTILATION

CORROSION OF DOMESTIC OIL TANKS

The objective of this External Research project was to investigate the corrosion of domestic oil tanks. Based on the findings, a number of predictive/preventative maintenance techniques as well as changes to tank fabrication were explored.

The project found:

- There is no significant difference in the composition or properties of the steel used today than what was used more than 30 years ago. Tank sludge is relatively, chemically neutral and the results of the micro biological testing do not support bacteria as the cause of corrosion.

- The primary cause of accelerated corrosion based on the findings of this research appears to be chloride-laden water. Water and chloride can gain entry into a domestic oil tank through a number of means, e.g., atmospheric moist air and salt-water fog, water leaks, sea water contamination.

- Using non-corrosive materials, e.g. stainless steel, fiberglass, bladders, to manufacture oil tanks is one way to prevent internal corrosion. A more economical approach would be to remove the corroding medium, i.e., water. Domestic oil tanks can be checked for water accumulation quite easily by using a water indicating paste. This process could be included as part of an oil burner technician's annual inspection.

Prepared by William Moody. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

EVALUATION OF RESIDENTIAL FURNACE FILTERS

Forced air furnaces are a common Canadian heating system. Traditionally, filters placed in the circulating air ductwork were designed to protect the furnace and fans. Over the last several years, there has been increased emphasis on improving the filtration efficiency with the goal of reducing occupant exposure to respirable particulate.

This project tested the performance of different filters in actual houses, from disposable fiberglass to electrostatic precipitators. The contractor looked at how air filtration affects the levels of particulates (airborne dust) in housing, and at the production of ozone by electrostatic precipitators.

Analysis shows that good filters do remove particulates at rates that are close to their rated performance. For example, the most effective filter tested, an electrostatic precipitator, reduced the quantity of particulate in the air in the duct from 70% - 90 % in different tests. But, because particulate is constantly infiltrating the house and is being created by occupant activities, the tests showed that when this very good filter was in operation, the concentration of airborne particulate in the house air was reduced only 40%. All other filters tested, being less efficient, fell in the range of less than 40% reduction. As well, these filters only work when the furnace fan is on. If the fan is not run continuously, installing good filtration will be even less effective.

A more comprehensive dust-reduction program is necessary (e.g. reducing house air leakage, better and more frequent vacuuming, reducing house particulate sources, etc.) to make a significant reduction in house airborne particulate, rather than simply increasing furnace filter efficiency. Upgrading filters is only a partial solution.

Prepared by Dara Bowser, Bowser Technical Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Don Fugler. CMHC, 1999. (Housing Technology Series)

Order number: PE0343

NOTE : Aussi disponible en français sous le titre : Évaluation des filtres pour générateurs d'air chaud résidentiels.

AVAILABILITY : CMHC Information Products

FIELD SURVEY OF HEAT RECOVERY VENTILATION SYSTEMS

Ventilation is one of the most important design issues of the 90's in the Canadian construction industry. Building codes promote the comfort and safety of occupants by ensuring fresh air is provided to new homes, and stale, contaminated air is exhausted outdoors. Increasingly, these code requirements are being satisfied by the use of packaged heat recovery ventilators (HRVs).

Given the increased reliance on HRVs for ventilation, several authorities expressed a desire to explore and assess the relationships between home design, mechanical ventilation system design, installation practices and occupant use of ventilation systems as they relate to the effectiveness of ventilation of the dwelling. In response to such concerns, Canada Mortgage and Housing Corporation engaged Buchan, Lawton, Parent Ltd to study the field performance of HRV ventilation systems.

The conclusions drawn from these results will make it possible to improve installation practices, HRV system performance, and occupant understanding of and interaction with their HRV system.

The project involved four phases: 1) inspections of 60 homes with HRV ventilation systems, 2) survey of the occupants of the 60 households to determine their understanding and usage of their HRV ventilation systems and a telephone survey of a further 15 households, 3) intensive performance testing of existing HRV ventilation systems, and 4) intensive performance testing of experimental HRV ventilation systems.

The methodology for Phases III and IV involved the use of a trace concentration of gas to assess air change rates. Sulphur Hexafluoride, an innocuous gas not found in household environments, was released at predetermined points throughout the house and mixed by mechanical means until similar concentrations were achieved throughout the house. By measuring the decay in the concentration of the gas, the apparent air change rates were derived. The operating conditions of the ventilation system and the locations of the sampling points had an impact on the extent to which the measurements reflected whole house ventilation rates, room-by-room ventilation rates, natural air change rates caused by forces other than mechanical ventilation systems, or other factors related to ventilation, such as short circuiting within rooms, and cross contamination.

The common types of HRV installations investigated under this study (fully ducted, simplified and extended) were capable of performing well. The majority of the HRV ventilation systems were operating and were perceived to be providing a benefit to the occupants of the houses. Far greater benefits were possible, however, and considerable improvements could be made in installation practice, system performance, occupant understanding and occupant interaction with their system.

Prepared by Buchan, Lawton, Parent Ltd (Toronto & Ottawa) and Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.

AVAILABILITY : Canadian Housing Information Centre

FIELD TESTS OF VENTILATION SYSTEMS INSTALLED TO MEET THE 1993 OBC AND 1995 NBC

This study concerns new houses designed and built to provincial or municipal codes that require the 1995 National Building Code (NBC). Ventilation requirements in recent Canadian building codes have become more complex and problematic to builders. The ventilation design needs to balance fresh air and exhausting air, and to consider house depressurization factors. The research team performed air testing on forty-one new houses in the western provinces, the North, and the Maritimes to verify their compliance with code required ventilation. Eleven houses were tested in Ontario, where the building code differs slightly from 1995 NBC. No houses complied with all appropriate codes and standards; many had dangerous levels of house depressurization. The contractor tested potentially compliant systems in three houses in Manitoba in December 1999 and January 2000. These three installed systems were close to compliance, but were not perfect.

The study identified some deficiencies with NBC Section 9.32 requirements, particularly regarding protection from depressurization for chimney-vented combustion appliances. The study concludes that builders and installers need to improve their knowledge of the NBC residential ventilation requirements, that NBC Section 9.32 is in need of some changes and that stricter enforcement of the residential requirements is needed.

The research findings have been disseminated throughout the builder, code official, and research communities to solicit solutions. A Task Group under National Research Council has come forward with changes to Section 9.32 of the NBC. These proposed clauses will be tested in sample houses, and must prove themselves practical and effective, prior to being brought forward as proposed changes to the NBC.

Prepared by Bert Phillips, Unies Ltd. Prepared for Research Division, Canada Mortgage and Housing Corporation and the NRC Canadian Commission on Building and Fire Codes. CMHC Project Officer: Don Fugler. Ottawa: CMHC, 2000.

AVAILABILITY : Canadian Housing Information Centre

IDENTIFYING AND REMOVING POLLUTANTS FR0M HEAT RECOVERY VENTILATORS

This study investigated the presence of allergens such as dust and molds in heat recovery ventilation systems and the duct work. It also looked at two different types of cleaning equipment and their ability to clean these pollutants from the rigid and flexible ductwork and heat recovery ventilator (HRV) cores in dedicated balanced supply and exhaust ventilation systems. Samples from the ductwork and cores of ten ventilation systems were tested for levels of dust and mold. The ductwork and cores were then cleaned using standard ductwork cleaning apparatus, then tested again to indicate the success of the cleaning process. All houses were tested for air and surface mold counts using an RCS air sampler and typical swab collection systems. Two of the ten houses were re-tested over a period of fifteen months. There were high mold counts on the surfaces of the supply air ducts. However, there was no correlation to house air mold counts, which were found to be inconclusive. It could not be determined whether airborne molds were considered a health risk in the houses as tested. It was also found that conventional equipment was not effective in cleaning the ductwork systems.

Prepared by Terry Watters, Sustainable Housing and Education Consultants Ltd. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

IMPORTANCE OF BATHROOM AND KITCHEN FANS. ABOUT YOUR HOUSE; CE17

This 4 page fact sheet outlines the importance of bathroom and kitchen fans in a home's ventilation system. It describes common fan and exhaust systems and how to choose the best system. Topics covered include: what to look for in bathroom fans, kitchen range hoods, noise and cleaning considerations, weather hoods, grills and backdraft dampers, and installation, fire and safety concerns.

Ottawa: Canada Mortgage and Housing Corporation, 2000. 4 pages

NOTE : Aussi disponible en français sous le titre : Importance des ventilateurs de cuisine et de salle de bains

AVAILABILITY : Canadian Housing Information Centre

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

ASSESSMENT REPAIR STRATEGY FOR EXISTING BUILDINGS CONSTRUCTED WITH MASONRY VENEER STEEL STUD WALLS

Canada Mortgage and Housing Corporation (CMHC) retained T.W.J. Trestain Structural Engineering to undertake a review of assessment and repair techniques for problem masonry veneer steel stud (MV/SS) walls. This document is intended to define state-of-the-art "good practice", a needed reference point upon which evaluations of deficiencies, renovation strategies and construction methods can be based.

Two competing approaches to field investigation are discussed - the medical model versus the technical audit model. Neither approach is sufficient on its own and a blended model is therefore proposed. Methods of gathering field information are discussed including a proposed systematic approach to the review of problem MV/SS walls. The successful diagnosis(es) of problem MV/SS walls requires an understanding of the basic engineering and building science issues. Accordingly, typical MV/SS deficiencies and the consequences associated with those deficiencies are presented.

In order to assist the investigator to answer the question "Is it good enough?", a number of analysis tools are proposed along with some suggested decision making criteria. The analysis tools include reduced Limit States Design load factors, conventional analysis, finite element analysis and full-scale field testing. The basic analysis routine for the finite element program was developed as part of another CMHC project and then customized with a number of features specifically for this project. Lastly, a compendium of possible maintain or restore strategies is presented for problem MV/SS walls. Included is a section on economic analysis which provides guidance on the optimum course of action that best meets the needs of public safety, building performance and the financial position of the building owners.

Prepared by T. W.J. Trestain. Prepared for Technical Policy and Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1996.

NOTE : Aussi disponible en français sous le titre : Stratégies d'évaluation et de remise en état des bâtiments existants à ossature en acier et à parement en maçonnerie.

AVAILABILITY : Canadian Housing Information Centre

COMPARATIVE ANALYSIS OF RESIDENTIAL CONSTRUCTION IN SEATTLE, WA AND VANCOUVER, B.C.

The purpose of this study was to compare wood frame residential buildings located in Vancouver B.C. and Seattle, WA and identify potential causal factors of building envelope problems. The comparative analysis will highlight any differences in construction materials, methods or codes/regulations which dictate specific techniques or building characteristics. The basic objective was to pinpoint any obvious differences that can be concluded as avoiding the typical causal factors leading to building envelope failure.

Four buildings were studied and compared; two «problem» buildings (one in each of Vancouver and Seattle) which had experienced problems, and two «control» buildings which had not experienced problems. The building attributes used as selection criteria for the sampling were: three to four storey wood-frame, stucco clad, built in last ten years as market (Strata or Condominium title) residential buildings.

The results of the study found some legislative (insurance) and contracting (bonding) differences, have created a more heavily regulated building industry in Seattle. This, allied with the slower economic activity in Seattle, may be a factor in improving the quality of residential construction, but there are as yet no available statistics (a current survey anticipates results in April 1999), which can provide comparable data of envelope performance problems or percentage of incidence to number of residential units.

The comparison of construction materials and envelope assemblies found some differences in sheathing material (gypsum board) and variability in the application of a vapour retarder. However, these differences did not appear to be significant in creating different causal factors leading to moisture related building envelope failures. The problem buildings in fact exhibited the same problematic features with respect to water management principles and failed to effectively balance moisture ingress, drainage and drying mechanisms. The prime failure mechanism in both locales is water bypassing the weather barrier and lack of protection of the sheathing from wetting (from an exterior source not interior moisture source).

The conclusions from the study indicate that face sealed design strategies are very sensitive to climatic/exposure and construction variables and therefore the reliance on concealed barrier systems is unlikely to achieve acceptable performance. Rainscreen wall assemblies offer the best opportunity to achieve acceptable performance.

Ottawa: Canada Mortgage and Housing Corporation, BERC, 1999.

AVAILABILITY : Canadian Housing Information Centre

CONDITION SURVEY OF HIGH-RISE RENTAL STOCK IN THE CITY OF TORONTO

This study was completed in two phases and provided two deliverables expected to be useful for future building evaluation and repair assessment. Phase I was the development of a survey instrument suitable for the assessment of high-rise rental housing condition and costs for repair. Phase II was the actual survey of buildings and the analysis of the findings.

The objective of the Phase II survey of buildings was to determine actual on site data on a statistically relevant sampling of buildings. A unique form of survey was needed to permit a relatively large sampling of buildings at a reasonably low cost per building. The survey protocol developed in Phase I allows easy recording of the data by suitably skilled people. The database structure employed to analyze the data is based on Microsoft Access and can be refined as needed to permit specific assessments.

The primary output is a survey of 63 high-rise buildings, in the Cities of Toronto and York, providing comprehensive building condition and repair data. The survey results are available for analysis; however, the actual building addresses and ownership was maintained in confidence. The results of the study are presented in this report. A separate database is provided, including the building data, but excluding address and ownership details.

The study was initiated out of a need to better understand the condition of the high-rise rental housing stock and thus, to be able to better come to grips with the needs of the buildings in order to sustain the stock into the future. While it is known that the majority of the existing high-rise rental stock in the Toronto area is in the order of 30 years old, reliable information on building condition, costs and repair needs are not well documented in a readily retrievable form. The study structure thus developed to meet the following goals:

- to sample the buildings in Central Toronto and determine costs for repair and condition of the buildings on the basis of a more reasonable cross-section of the building population.
- to improve on the cost and condition information by providing 1) condition and cost data on a large sample of buildings; 2) costs over a ten year period; and 3) a range and frequency distribution of costs for buildings, different building systems and different repair periods in the future.
- to provide data on the condition of buildings that will facilitate the direction of research appropriate to building repair strategies.

Prepared by Gerald R. Genge Building Consultants Inc. Prepared for Canada Mortgage and Housing Corporation, the City of Toronto and the City of York. CMHC Project Officer: Sandra Marshall. Sutton West, ON: Gerald R. Genge, 1998. 2 volumes.

AVAILABILITY : Available only on a loan basis from:

DRYING OF WALLS WITH VENTILATED STUCCO CLADDING: A PARAMETRIC ANALYSIS

A parametric study of stucco clad wall systems was undertaken to help understand the drying behaviour of outer wall venting systems and to determine which systems would be worth investigating in an experimental test program be the Envelope Drying Rates Analysis Consortium (EDRA). In the course of the investigation, additional questions arose about how the study would be conducted, and simulations were provided to help guide the test program.

The main objective was to study ventilation cavity parameters for stucco wall systems using WALLDRY, a computer program developed by Canada Mortgage and Housing Corporation (CMHC). A significant number of combinations of ventilation cavity depths and vent gap heights were included to assist the EDRA steering committee to decide on the final parameters for the experimental work. This report details the findings for steady-state laboratory conditions with different thermal and relative humidity (RH) conditions.

Prepared by Donald M. Onysko, DMO Associates. Ottawa: Canada Mortgage and Housing Corporation, c2000. (Housing Technology Series; Research Report) xi, 62 pages.

Order number: PE0375

NOTE : Aussi disponible en français sous le titre : Analyse paramétrique de l'assèchement des murs revêtus de stucco ventilé.

AVAILABILITY : CMHC Information Products

ENVIRONMENTAL ASSESSMENT TOOL FOR MULTIFAMILY BUILDINGS: PHASE III FINAL REPORT: ENVIRONMENTAL ASSESSMENT OF FOUR BUILDINGS

This is a report on the third phase of an assessment of existing environmental assessment methods with the intent of identifying the basis for a comprehensive multifamily residential assessment tool.

CMHC wishes to identify the requirements of a comprehensive tool to assess energy and resource use, durability, environmental impact, indoor air quality and a host of other areas in multifamily residential buildings. The assessment tool is needed to:

- evaluate sustainable building projects;- raise industry and consumer awareness of sustainable building issues;- assess compliance with future sustainable building regulations;- assess the impact of energy retrofits on existing buildings.

Most of the tools in use were developed for commercial offices and may not adequately assess multifamily buildings. CMHC wished to identify elements of the existing commercial tools adaptable to multifamily buildings, while developing other elements that were underdeveloped or missing.

Phase III was to utilize an existing environmental assessment tool to evaluate the green performance of four existing multi-family buildings. The "GBC '98 Assessment Manual: Volume 4: Multi-Unit Residential Buildings" was chosen as the assessment methodology. Three of the buildings were recently constructed advanced buildings, while the fourth building was a market-ready condominium built in the early 1980's with a number of advanced features and amenities for the times.

Prepared by Caneta Research Inc., Lowans & Stephen, Young + Wright, Innovative Management Solutions. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Cate Soroczan. Ottawa: CMHC, 1998 i.e. 2000. ca 64 pages

AVAILABILITY : Canadian Housing Information Centre

HIGH-RISE APARTMENT REPAIR NEEDS ASSESSMENT IN THE FORMER CITIES OF TORONTO AND YORK

Recognizing that rental buildings are aging, the condition of high-rise rental housing has been a concern for over 15 years. Previous studies and anecdotal reports on repairs have suggested costs ranging from less than $10,000/unit to over $20,000/unit. What has been absent from the evaluations to date has been a rigorous assessment of actual buildings for real costs for repair. This study provides that assessment.

The study of a sample of 63 high-rise buildings was completed using an evaluation protocol developed to quickly gather information in a format that was data-entry ready. Analysis of the data on seven major building systems, comprised of 21 different major building subsystems, was conducted using a Microsoft Access-based database. This report provides a summary of the findings, including the typology of the building, typical complaints, and repair costs on a per-unit basis. In addition, information on energy conservation measures, albeit minimal within the scope of this study, is appended.

To assist in assessing the condition of the buildings as a whole, a new rating tool was devised. The 'rating' value was assessed for each system and then calculated for each building to help establish an appropriate gauge of the condition of the building. The building condition could be incorrectly gauged if per-unit costs alone were used as the measure of condition. The rating tool is expected to be useful in the future to compare conditions found now and later, and to compare the conditions of buildings in different cities.

The findings are described and cross-relationships are made against the following criteria:

1. The four age groups surveyed, i.e. pre-1960's, 1960's, 1970's, and post-1970's buildings.
2. The four time frames for repair, i.e. Immediate, 1 to 2 years, 3 to 5 years, and 6 to 10 years.

The seven primary building systems and 21 building subsystems are used to establish a typology for the buildings within the four age groups.

Prepared by Gerald R. Genge, Building Consultants Inc. Prepared for Canada Mortgage and Housing Corporation and the former cities of Toronto and York. CMHC Project Officer: Sandra Marshall. Ottawa: CMHC, 1998, i.e. 2000

NOTE : Aussi disponible en français sous le titre : Évaluation des besoins de réparation des tours d'habitation dans les anciennes villes de Toronto et de York

AVAILABILITY : Canadian Housing Information Centre

MECHANICAL AND ELECTRICAL SYSTEMS IN APARTMENTS AND MULTI-SUITE BUILDINGS: A PRACTITIONER'S HANDBOOK

An advisory document entitled "Mechanical and Electrical Systems in Apartments and Multi-Suite Buildings" is now available, in both official languages to recommend "good engineering practice" for designers, owners and consultants. The publication covers basic building science issues as they relate to mechanical systems, design techniques useful for space heating, cooling, ventilation, plumbing and electrical systems. In some cases fundamental design steps are provided but the manual is not meant to replace basic engineering design procedures. Desirable design and installation features are described that will provide for efficient and effective operation of multi-unit residential buildings. The primary readership is HVAC system designers with university or college training, installers, educators and building code officials.

Prepared by Wayne Webster, the principal author; Cedric Trueman, the associate author; and Dan Dederer, the principal technical resource for Chapter 9. Ottawa: Canada Mortgage and Housing Corporation, c1999.

Order number: NE2049 **Price: $24.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Installations mécaniques et électriques des immeubles résidentiels : guide pratique

AVAILABILITY : CMHC Information Products

QUALITY BY DESIGN: A QUALITY ASSURANCE PROTOCOL FOR WOOD FRAME BUILDING ENVELOPES IN BRITISH COLUMBIA

Quality by design was commissioned as the Quality Assurance Protocol by Canada Mortgage and Housing Corporation in order to establish a management system for the assurance of quality of the exterior of multi-storey wood frame buildings located in the coastal climate of British Columbia. This is part of the initiatives undertaken by the Building Envelope Research Consortium, of which CMHC is a prominent member, to address the "leaky condo" issue as it pertains to new construction.

The Quality Assurance Protocol applies to quality assurance in: design, project and building site management, construction, warranty and maintenance. This document outlines the proposed Quality Assurance Protocol and includes a generic Quality Manual. It brings together thinking about building envelope quality from a representative sample of all of the design and construction professionals who produce building envelopes. It is designed to be practical and usable. It is based on a recognized international standard, ISO 9001:1994, which is a quality system standard likely to become prevalent in Canada in the next few years. Persons adopting the Protocol will find it eases their future adoption of ISO 9001.

Prepared by Pro Pacific Architecture Limited. Principal investigators: Brian Palmquist and William A. Gies, assisted by Arc Rajtar. CMHC Project Officers: Jacques Rousseau and Mark Salerno. Ottawa: Canada Mortgage and Housing Corporation, 1999.

AVAILABILITY : Canadian Housing Information Centre

RAINSCREEN 2.1 COMPUTER PROGRAM

The RAINSCREEN program has been developed to assist in the design of rainscreen pressure equalized wall assemblies. A new version of the RAINSCREEN computer program, including a tutorial program and a manual that will be much more user-friendly has been produced and is available on the Internet:
http://www.cmhc-schl.gc.ca/Research/HighRise/files/rainscreen.html

AVAILABILITY : On the Internet at the following address:
http://www.cmhc-schl.gc.ca/Research/HighRise/files/rainscreen.html

RENOVATION OF AN APARTMENT BUILDING WITH SOLID MASONRY WALLS

A 90 year old building with solid clay brick walls has been gutted and renovated into a multi-family residential building for low income persons. The renovation involved the addition of thermal insulation to the inside of the building envelope, the application of stucco to the exterior of three of the four sides of the building, restoration of the front masonry facade, installation of a mechanical ventilation system with ventilation in each room, and a combination hydronic baseboard/radiant floor heating system. This renovation was of particular interest as it represented a unique opportunity to evaluate the impact of insulating formerly un-insulated solid masonry walls - a subject of much interest and controversy within the building rehabilitation industry. The project also demonstrated how the most current understanding of building envelope durability, heating and ventilation systems and indoor air quality could be implemented within an otherwise unremarkable renovation project.

The building envelope was monitored for thermal and moisture performance. Energy, water use and indoor air quality were also monitored in the renovated building.

Based on 15 months of measured readings of wood moisture pins placed in the walls and attic of the retrofitted building, the rehabilitation has been successful in reducing wall heat flow by conduction while maintaining safe moisture content levels in the wood members. The indoor air quality in the building was greatly improved through the use of mechanical ventilation system with ventilation provided to each room in each apartment.

Prepared by: Dr. Robert Dumont, Larry Snodgrass, Jerry Makohon, Building Performance Section Saskatchewan Research Council. SRC Project Manager: Dr. Robert Dumont. Prepared for: Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: Duncan Hill. Ottawa: CMHC, 1999.

AVAILABILITY : Canadian Housing Information Centre

STUCCO-CLAD WALL DRYING EXPERIMENT, VANCOUVER, BRITISH COLUMBIA: RESEARCH REPORT

The deterioration of wood framed walls in southwestern British Columbia is a consequence of an inability of the exterior walls to manage rainwater. The effective performance of these walls will ultimately depend on the combination of limiting the wetting of wall components that are susceptible to deterioration, and enhancing the drying of these components should they become wet. The rainscreen principle is a design approach that will limit the wetting of wall components, thus achieving the first half of the combination. However, the unresolved issue is whether it will enhance the drying of these components should they become wet.

An experiment was conducted to measure the effect of drainage cavity design on the drying of water from insulated stud cavities. Seven test specimens, five wood framed and two steel framed, were included in the experiment. All were finished with stucco cladding. Temperature and vapor pressure difference were controlled across the specimens, but other environmental forces such as solar and wind effects were not simulated. After a measured quantity of water was injected into the stud cavities, the drying of the specimens under controlled conditions was monitored for 5-1/2 months.

The following conclusions are drawn from the experiment:

- The drying process for all specimens was very slow and took months to achieve any significant effect.

- Improved drying of water that penetrates into the stud cavity is not a benefit of the rainscreen design. The drying rate was not affected by cladding design, either face sealed or rainscreen, nor by drainage cavity design. It also follows that the drying rate will not be improved by the cladding system type (stucco, vinyl siding, brick veneer, etc.).

- Moisture movement within the specimens was very limited. From a practical perspective, where water enters a wall is where it stays and a small leak can lead to a local problem.

This experiment has shown that design for effective rainwater management is important since it is essential that little if any water be permitted to get into the stud cavity.

Prepared by Morrison Hershfield Ltd. CMHC Project Officers: Jacques Rousseau and Mark Salerno. Ottawa: Canada Mortgage and Housing Corporation, 1999.

AVAILABILITY : Canadian Housing Information Centre

WIND-DRIVEN RAIN STUDY FOR THE GOVERNOR'S ROAD PROJECT, DUNDAS, ONTARIO

This report on the study of wind-driven rain action on the Governor's Road Project in Hamilton, Ontario provides the following information:

- wetting patterns for the Governor's Road Project building without cornice protection;
- wetting patterns for the Governor's Road Project building with cornice protection; and
- a cornice effectiveness evaluation.

A three-dimensional numerical model of the project building geometry, and the wind and rain conditions were designed using commercial computational fluid dynamics software, FLUENT 4.3 (Users Guide, 1996). The building model was numerically tested in atmospheric turbulent boundary layer flow conditions for one dominant wind direction.

Prepared by H. Hangan and D. Surry. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, c2000. (Housing Technology Series; Research Report)

NOTE : Aussi disponible en français sous le titre : Étude de la pluie poussée par le vent portant sur l'ensemble résidentiel de Governor's Road, Dundas (Ontario)

AVAILABILITY : Canadian Housing Information Centre

WOOD-FRAME ENVELOPES IN THE COASTAL CLIMATE OF BRITISH COLUMBIA. BEST PRACTICE GUIDE, BUILDING TECHNOLOGY

Building in BC's coastal climate has special challenges -- and this 256 page guide is the most up-to-date, authoritative information available to help meet those challenges. This guide provides the most comprehensive technical information on how to build to withstand the conditions of BC's coastal climate.

The guide is intended to provide guidance, primarily to designers, for the design of the building envelopes of multi-unit wood-frame buildings in the coastal climate zone of British Columbia. The guide should also be useful to the construction industry in general, encouraging an understanding of the behaviour and performance of building envelope assemblies.

Although the guide is intended to reflect good practice in general, its primary focus is on the management of moisture, since moisture-related performance problems prompted this initiative. The guide therefore does not deal specifically with structural, acoustic or fire and safety issues that may also have an impact on the design of the building envelope.

The information in the guide includes behaviour of wood in construction, moisture source control strategies, heat flow mechanisms, typical envelope assembly characteristics, and materials for inclusion in specifications, quality assurance strategies, maintenance and renewal strategies and more than fifty-three state-of-the-art CAD details showing several air barrier strategies, all included on the companion CD-ROM.

Endorsed by the Canadian Wood Council (CWC) and the Building Envelope Research Consortium (BERC).

Prepared by RDH Building Engineering Limited in joint venture with Morrison Hershfield Limited. The two dimensional drawings were prepared by Hewitt Tan Kwasnicky Architects Inc. and the chapter on Behaviour of Wood was prepared by Don Onysko. Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE2178 **Price: $89.00 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Enveloppe de bâtiments à ossature de bois dans le climat littoral de la Columbie-Britannique, Guide des règles de l'art : technologie du bâtiment.

AVAILABILITY : CMHC Information Products

HIGH-RISE AND MULTIPLE UNIT CONSTRUCTION

WOOD FRAME ENVELOPES. BEST PRACTICE GUIDE, BUILDING TECHNOLOGY

Designer, builders, building owners and managers who consult this guide should gain a general understanding of the principles and practical considerations of designing and constructing wood frame envelopes. The Guide emphasizes the best residential construction practice details and specifications used in design offices and on construction sites across Canada.

The information includes the behaviour of wood in construction, moisture control strategies, heat flow mechanisms, typical envelope assembly characteristics, components and materials for inclusion in specifications, quality assurance, maintenance and renewal strategies. More than 30 clearly drawn construction details on CD-ROM are easy to download into a CAD program. Metric and imperial measures, French and English in different layers.

Prepared for Canada Mortgage and Housing Corporation by Otto Bryden Erskine Martel Architects Inc., and subsequently by Otto and Erskine Architects Inc., in joint venture with Halsall Associates. The National Research Council of Canada, the Canadian Home Builders' Association, the Canadian Wood Council and the New Brunswick Home Builders' Association assisted in development of this book. Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE6921 **Price: $89.00 + GST and handling charges.

NOTE: Aussi disponible en français sous le titre : Enveloppe de bâtiments à ossature de bois. Guide des règles de l'art : technologie du bâtiment.

AVAILABILITY : CMHC Information Products

HOME OWNERSHIP

HOMEOWNER'S MANUAL

The Homeowner's Manual was designed to provide builders with a tool to reduce the time and cost of customer callbacks. Builders can now provide their clients with a Homeowner's Manual filled with practical, easy-to-read information on operation and maintenance customized for their new home.

The Homeowner's Manual is a print-on-demand product to allow for customization. It is divided into three sections covering:

1) customized information based on the particular specifications of the individual home (e.g. type of roofing, foundation ...)
2) generic home care information, seasonal maintenance charts ...
3) a plastic sleeve for inclusion of the New Home Warranty, home plans ...

The Homeowner's Manual is endorsed by the Canadian Home Builder's Association (CHBA) as well as the Canadian New Home Warranty Council (NHWC). Builders who are members of the CHBA or provincial members of the NHWC will have the appropriate association logos printed on the cover of the product.

Builders who purchase this manual for their customers will be providing outstanding customer service, enhancing their professional image and reducing after-sales service costs.

HOME OWNERSHIP

The primary benefit to homeowners is a customized and comprehensive permanent reference tool to help them operate and maintain their new home. It has easy-to-follow text, lots of clear illustrations and environmental, money-saving and health tips.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE2322 **Price: $39.95 + GST and handling charges.

NOTE: Aussi disponible en français sous le titre: Manuel du propriétaire-occupant.

AVAILABILITY : Canadian Housing Information Centre

HOMELESSNESS

CITY OF TORONTO RENT BANK PILOT PROJECT EVALUATION: FINAL REPORT

The City of Toronto established a Rent Bank Pilot Project in May, 1998 to help prevent the eviction of mother-led single parents by providing a repayable loan for rental arrears and support services. The City selected a proposal for a partnership among four community agencies in the City's downtown east end (Neighbourhood Information Post, Regent Park Community Health Centre, Central Neighbourhood House and Dixon Hall) to operate the Pilot Project. Initial funding for the project was provided by the City of Toronto and the United Way with the contribution of staff and staff resources by the participating agencies. The evaluation of the Project is funded by Canada Mortgage and Housing Corporation. In January, 1999, the Mayor's Homelessness Action Task Force also recommended that a Rent Bank be established for tenants as an eviction prevention strategy and a way of preventing homelessness.

The City retained Linda Lapointe and Tim Welch to conduct an evaluation of the Rent Bank Pilot Project. This evaluation and the recommendations developed by the consultants are the result of a six-month evaluation process that began in early 1999. In addition to data obtained on clients from the participating agencies, the consultants also attended several meetings of the Steering Committee, interviewed individuals from agencies on the Steering Committee, landlords, several Rent Bank tenants and representatives of similar programs in other jurisdictions. A mini survey was also conducted by staff on the status of the Rent Bank clients in May, 1999.

The evaluation reviews the characteristics of Rent Bank users, how the loan impacted on their lives and their housing and how the program was administered and delivered. The report concludes with a set of recommendations that will provide assistance to the City as it moves towards an expanded Rent Bank program. For the year 1999, Toronto City Council allocated a fund of $200,000 for this program.

Prepared by Lapointe Consulting and Tim Welch and Associates under the direction of Susan Bacque of the City of Toronto's Shelter, Housing and Support Division. CMHC Project Officer: Anna Lenk. Toronto: The Division, 1999.

AVAILABILITY : Shelter, Housing and Support Division City of Toronto
7th Floor, Metro Hall
55 John Street
Toronto, Ontario M5V 3C6
Tel: 416-392-1264

DOCUMENTATION OF BEST PRACTICES ADDRESSING HOMELESSNESS

CMHC has documented a cross-section of ten "best practices" projects that have effectively addressed the needs of homeless people and those "at risk" of homelessness. These projects represent a broad range of responses to homelessness and illustrate the diversity of the homeless population throughout the country.

Several criteria were developed to determine which projects to document. It was important that projects demonstrate that homeless persons were involved in developing solutions, that they were empowered to actively pursue the goal of independence, and that safety and security was offered, especially to vulnerable groups such as women, children and youth. Other factors were deemed to be important in denoting effective practices such as:

- Integration of front line service providers in the development of solutions;
- multidimensional approach to meeting needs;
- variety of services to respond to sub-populations; and
- freedom to challenge current beliefs and norms about the nature of the problem.

Six projects were fully documented providing an executive summary, fact sheet, project history, client profile, management and financial profile, and a description of the overall philosophy and approach for each one. Four projects were also documented similarly but in a more condensed form.

Written by Best practice agencies. Coordinated by Luba Serge, Housing Consultant. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Gloria Neufeld Redekop. Ottawa: CMHC, 1999. (Distinct Housing Needs Series)

Note : Aussi disponible en français sous le titre : Documentation des pratiques exemplaires d'intervention auprès des sans-abri.

AVAILABILITY : Canadian Housing Information Centre

REPORT ON A FEASIBILITY STUDY FOR A PILOT INFORMATION SYSTEM FOR CANADIAN SHELTERS FOR HOMELESS INDIVIDUALS AND FAMILIES

Following a conference on homelessness in June 1995, Canada Mortgage and Housing Corporation (CMHC) initiated a series of projects to test need and demand for a pilot information system for shelters for homeless individuals and families. The intent of the research was to develop such an information system, if needed and feasible. This report represents the second step in this work--a feasibility study on a pilot information system for shelters and an outline of possible information system specifications.

The feasibility study obtained assessments of need for an information system, and views as to how it could work, from organizations operating 62 shelters in cities in all regions of Canada.

The study results indicate that considerable interest exists in a shelter information system (90 per cent of shelters indicated that they felt shelters would benefit from an information system, and 63 per cent indicated that they would consider participation). The feasibility study results suggest that shelter interest in a national information system is substantial, widely based across Canada, and it is feasible to develop a pilot information system for shelters for homeless persons and individuals in Canada. The researchers recommend that such a system be developed, with strong shelter input at each stage as has been the case so far. Such a system would be used by participating shelters, with important uses for planning, advocacy and case management.

Prepared by SPR Associates Inc. CMHC Project Officer: John Engeland. Ottawa: Canada Mortgage and Housing Corporation, 1999. (Distinct Housing Needs Series)

NOTE : Aussi disponible en français sous le titre : Rapport sur une étude de faisabilité visant un système pilote d'information applicable aux centres d'hébergement canadiens pour personnes et familles sans-abri.

AVAILABILITY : Canadian Housing Information Centre

ROUNDTABLES ON BEST PRACTICES ADDRESSING HOMELESSNESS: BACKGROUND REPORTS AND SUMMARIES

CMHC co-hosted five regional roundtables in April 1999 and a national roundtable in June 1999 on best practices addressing homelessness, using the "Best Practices Addressing Homelessness: Documentation" as a basis for discussion. The regional roundtables were co-hosted by CMHC and local homelessness organizations. The roundtables were effective opportunities for network building and exchange of information on effective best practices. A final document was prepared containing brief summaries of the six roundtables and "regional backgrounders" on key homelessness issues, prepared by the co-host homelessness organizations.

Ottawa: Canada Mortgage and Housing Corporation, c1999. (Distinct Housing Needs Series)

NOTE : Aussi disponible en français sous se titre : Tables rondes sur les pratiques exemplaires d'intervention auprès des sans-abri.

AVAILABILITY : Canadian Housing Information Centre

WOMEN ON THE ROUGH EDGE: A DECADE OF CHANGE FOR LONG-TERM HOMELESS WOMEN

There have been significant changes over the past decade in the profile of women's homelessness and the service context. The proportion of women who use the emergency shelter system in Toronto increased from 24 to 37 percent from 1988 to 1996. As more women become homeless and the existing social service and health system is less able to assist them, the most vulnerable stay homeless for longer periods.

This report constitutes a retrospective review of the changing patterns of women's homelessness in the Toronto area from 1987 to 1997, with a focus on conditions and services for long-term homeless women, based on the observations and expertise of those who have worked closely with homeless women over the previous decade. Interview data from a small number of homeless women are included, along with a research-based profile of long-term homelessness among women in Toronto.

The report discusses distinctions in shelter and other service use patterns among homeless women (i.e., transitional, episodic, and chronic homelessness) and implications for housing and support service requirements. Women who are homeless for long periods of time face similar circumstances as other homeless women except that their personal resources are fewer, their state of physical and mental health poorer, and their individual capacity to cope is weaker. They are very likely to have severe mental health problems, and it appears that the prevalence of addictions is increasing.

Prepared by Sylvia Novac, Joyce Brown, Gloria Gallant. CMHC Project Officer: Brenda Baxter. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

Note : Aussi disponible en français sous le titre : Femmes en difficulté : une décennie de changements pour les femmes sans-abri à long terme

AVAILABILITY : Canadian Housing Information Centre

HOUSE CONSTRUCTION

APPLICATION OF STRUCTURAL STEEL TO SINGLE-FAMILY RESIDENTIAL CONSTRUCTION

This study is an investigation of the use of structural steel in single-family residential construction, and an analysis of its applicability to Canada, taking into account technical requirements, cost-effectiveness, and sustainability.

With the rise of housing costs, global competition, and increasing environmental concerns, new systems and innovative uses of material are required to supplement the existing construction methods. Numerous studies have demonstrated the potential of steel for building and its advantage in terms of price, performance, and physical properties. Residential projects in steel are usually built with lightweight metal framing systems. Structural steel is seldom used, although it offers additional advantages in terms of performance, economy, flexibility, and speed of construction, as well as a wide availability of skills, trades, and experience from the commercial and industrial building sector.

The purpose of the study is to provide to decision-makers in the building industry a clear view of the possibilities offered by the application of structural steel to housing.

The 200-page report addresses the following topics:

- steel and metal building systems in the context of housing;
- existing steel houses worldwide and in Canada;
- source of information for steel technology;
- compliance with building codes;
- Canadian steel suppliers and trades;
- prototype design of a steel house;
- steel house and sustainability.

Prepared by Michel de Spot, Node Engineering Corp. CMHC Project Officer: Rob Duncan. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

COMPREHENSIVE ANALYSIS OF SELF-BUILD HOUSING EXPERIENCES

The objective of this report is the development of a comprehensive analytical framework to evaluate self-build experience both in Canada and abroad and to determine the potential transferability of international initiatives to the Canadian context. The mandate was to develop a practical tool for the comparative analysis of self-build initiatives, a tool which could identify the major factors that contribute to the success or failure of any given initiative. The focus of the self-build initiatives chosen for analysis is primarily on urban multi-family and rehabilitation examples.

Six categories were selected for use in the analytical framework as a method of classifying the factors that are essential to the success of an evaluated self-build initiative. These categories are: organization; financing; design; construction; post-occupancy; and institutional context.

Chapter 1 of the report defines self-build, differentiating it from the concept of self-provision and from the broader context of self-help. The second chapter outlines the numerous issues relevant to a discussion of self-build and provides a justification for the selection of the six categories used in the evaluative framework. The analytical framework itself is then described: the Stage 1 level of analysis which proceeds by submitting a chosen self-build initiative to a series of 30 critical questions, and the Stage 2 level of analysis which provides a more detailed evaluation by submitting a selected initiative to a total of 146 questions. A brief description is provided for each of the 30 critical questions, and the 146 detailed evaluation questions are listed.

The third chapter presents a profile of the 30 self-build initiatives that were analyzed according to the Stage 1 and Stage 2 levels of analysis.

Conclusions are presented in the fourth chapter, followed by a complete bibliography. The appendices to the report include a guidebook to the analytical framework to help the user identify either key positive factors or weaknesses/failings in an examined initiative and to receive advice or guidance for further consideration in terms of the initiative's validity and its applicability to the Canadian context.

Prepared by Avi Friedman, Steve Pomeroy, David Krawitz, and Alexander Smith. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: David Scherlowski. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series Research Report)

Order number: PE0357

NOTE : Aussi disponible en francais sous le titre : Analyse détaillée d'expériences en autoconstruction

AVAILABILITY : CMHC Information Products

DEVELOPMENT OF GENERIC ENGINEERED DETAILS FOR THE CONSTRUCTION OF RESIDENTIAL TALL WALLS

Part 9 of the Alberta Building Code (1997) defines maximum allowable heights for exterior loadbearing walls based on their physical characteristics and the loads they support. The code, however, only specifies requirements for walls up to approximately 12 feet in height. Walls exceeding that height must be individually engineered. Significant time and expense could be saved through the availability of generic, engineered data which would allow builders in Alberta to select appropriate material and installation configurations for the tall wall requirements incorporated in their various projects. The purpose of this project was to develop such data.

Several general configurations were identified for analysis. These configurations included both solid walls and walls with varying window layouts. The range of wall dimensions was 7 to 16 feet in width by 10 to 20 feet in height. Some appurtenant components generally thought to provide additional support for tall walls were also included in the analysis. These included horizontal feature shelves, fireplaces located in corners and intra-span, interior partitions, and hip roofs.

Developmental work followed generally accepted principles of limit states design. Load carrying capacity and lateral deflection were defined as the governing limit states. The general design philosophy encompassed examination and classification of live loads throughout the province, and development of tables that link the load classification at a particular location to allowable tall wall characteristics for that location.

Two types of tall walls were developed. The first case - tables which identify the maximum widths of loadbearing walls of given height - was chosen as a means of addressing the option to construct tall walls in two vertical lifts. The second case - tables that identify the maximum height to which a loadbearing wall may be built - addresses the option of building tall walls with full height stud members. In the first case, stress and deflection due to wind loads constituted the governing conditions. Allowable deflection was set at 1/180 of the width of the wall. In the second case, the combination of axial loading and bending moments caused by wind loading was considered, and either stresses or deflections governed the allowable height of the wall, depending on load combination.

The structural contributions of the appurtenant components studied were found to be minimal. From the generic perspective, whatever contributions could be afforded by these items would be lost to design allowances that would have to be made to compensate for the large number of variables associated with their installation. These variables include vertical and horizontal positions on the wall, materials used, and fastening methods used. Details describing these items would have to be intricate and the potential for another field variable - misapplication of intended specifications - would likely be introduced.

The tables developed within the scope of this project allow extension of the existing limits of the Alberta Building Code, 1997 edition. Table 9.23.10.1 of the code allows walls up to approximately 12 feet in height to be built without professional design input. Properly utilized, these tables allow the construction of walls up to approximately 25 feet in height (dependent upon load conditions) to be built in Alberta without professional design input. Some situations will exist where the tables do not address the requirements of a particular project or a particular project cannot comply with the conditions accompanying the use of the tables, and in these circumstances, individual professional design will remain a requirement.

Prepared by Campbell Woodall & Associates Consulting Engineers Ltd. CMHC Project Manager: Darrel R. Smith. Prepared for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999.

AVAILABILITY : Canadian Housing Information Centre

DIE KANADISCHE HOLZRAHMENBAUWEISE AND FACHAUSDRÜCKE IM HÄUSERBAU

This kit includes the German language versions of the "Canadian Wood-Frame House Construction" and "Glossary of Housing Terms" for $29.95.

"Canadian Wood-Frame House Construction" is the 'bible' on building wood-frame houses in Canada. A step-by-step guide from excavation to the finishing touches, this ideal learning tool and essential job-site reference is indispensable for builders, renovators, students and do-it-yourselfers. Updated to conform to Canada's National Building Code requirements, it includes new illustrations and handy sizing tables; metric and imperial measurements; Planning ahead and Checking Back notes; plus healthy housing tips to improve indoor air quality and minimize environmental impacts.

"Glossary of Housing Terms" is an A-to-Z of housing terms! This thoroughly revised, comprehensive dictionary lists more than 1,200 housing definitions. Canada's authoritative reference book for builders, students and the informed homeowner for more than 30 years.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NG2420 **Price: $29.95 + GST and handling charges.

NOTE: Also available in English, French, Spanish and Russian editions.

AVAILABILITY : This package deal will be available for sale at the price of $29.95 through our 1-800-668-2642 in Canada. For international clients please call (613) 748-2003; credit card only orders will be accepted.

LOG HOMES: FREQUENTLY ASKED QUESTIONS. ABOUT YOUR HOUSE; CE 21

This 4 page fact sheet deals with the unique design and building considerations of log homes. Its coverage of frequently asked questions and CMHC's answers include the following: -- what to look for in a log home contractor or dealer and what are some of the questions to ask them?-- what to look for in a building site?-- how does the cost of building a log home compare to the cost of building a conventional frame house?--what are some of the benefits of owning a log home?-- what are the differences in the corner systems of a log house?The fact sheet also deals with the concerns of shrinkage and settling, moisture, insects and fungi, refinishing, the installing of plumbing, electricity and heating systems in log homes and their energy efficiency.

Ottawa: Canada Mortgage and Housing Corporation, 2000. 4 pages

Note: Aussi disponible en français sous le titre : Foire aux questions - maisons en rondins

AVAILABILITY : Canadian Housing Information Centre

MANUAL DE CONSTRUCCIÓN DE VIVIENDAS CON ARMADURA DE MADERA - CANADA AND GLOSARIO DE TÉRMINOS DE CONSTRUCCIÓN DE VIVIENDAS

This kit includes the Spanish language versions of the "Canadian Wood-Frame House Construction" and "Glossary of Housing Terms" for $29.95.

"Canadian Wood-Frame House Construction" is the 'bible' on building wood-frame houses in Canada. A step-by-step guide from excavation to the finishing touches, this ideal learning tool and essential job-site reference is indispensable for builders, renovators, students and do-it-yourselfers. Updated to conform to Canada's National Building Code requirements, it includes new illustrations and handy sizing tables; metric and imperial measurements; Planning ahead and Checking Back notes; plus healthy housing tips to improve indoor air quality and minimize environmental impacts.

"Glossary of Housing Terms" is an A-to-Z of housing terms! This thoroughly revised, comprehensive dictionary lists more than 1,200 housing definitions. Canada's authoritative reference book for builders, students and the informed homeowner for more than 30 years.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NS2449 **Price: $29.95 + GST and handling charges.
NOTE: Also available in English, French, German and Russian editions.

AVAILABILITY : This package deal will be available for sale at the price of $29.95 through our 1-800-668-2642 in Canada. For international clients please call (613) 748-2003; credit card only orders will be accepted.

RESIDENTIAL DECONSTRUCTION MANUAL

The intent of this manual is to provide project managers (architects, engineers, interior designers, associated technicians and technologists, contract administrators, contractors, and site supervisors) involved in residential (single family and multi-unit) demolition with a reference tool to assist them in the economic feasibility assessment, planning and supervision of deconstruction.

Prepared by Derek Badger. CMHC Project Manager: Darrel R. Smith. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

SEUILS D'ACCÈS AUX BALCONS D'IMMEUBLES D'HABITATION : PROBLÉMATIQUES ET PISTES DE SOLUTIONS

The objective of this project was to demonstrate to architects, builders, developers and regulatory agencies the possibilities of producing easy-access thresholds to balconies in new or renovated residential buildings.

Prepared by Pierre Richard Architecte, Archiconcept inc. CMHC Project Officer: Sandra Marshall. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

STROITEL 'STVO DEREVYANNYKH KARKASNYKH DOMOV V KANADE AND GLOSSARIY TERMINOV PO ZHILISHCHNOMU STROITEL' STVU

This kit includes the Russian language versions of the "Canadian Wood-Frame House Construction" and "Glossary of Housing Terms" for $29.95.

"Canadian Wood-Frame House Construction" is the 'bible' on building wood-frame houses in Canada. A step-by-step guide from excavation to the finishing touches, this ideal learning tool and essential job-site reference is indispensable for builders, renovators, students and do-it-yourselfers. Updated to conform to Canada's National Building Code requirements, it includes new illustrations and handy sizing tables; metric and imperial measurements; Planning ahead and Checking Back notes; plus healthy housing tips to improve indoor air quality and minimize environmental impacts.

"Glossary of Housing Terms" is an A-to-Z of housing terms! This thoroughly revised, comprehensive dictionary lists more than 1,200 housing definitions. Canada's authoritative reference book for builders, students and the informed homeowner for more than 30 years.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NR2421 **Price: $29.95 + GST and handling charges.
NOTE: Also available in English, French, Spanish and German.

AVAILABILITY : This package deal will be available for sale at the price of $29.95 through our 1-800-668-2642 in Canada. For international clients please call (613) 748-2003, credit card only orders will be accepted.

USE OF CONVENTIONAL CROSS BRIDGING IN WOOD-I-JOIST FLOORS

The use of cross bridging in improving performance and load-carrying capacities of conventional sawn lumber joist floors is well known. With the rapid substitution of solid sawn joists by prefabricated wood I-joists and the tendency of builders to adopt conventional construction techniques for this relatively new product, there is need to evaluate if the same type of bridging can be used equally effectively for floors built with wood I-joists. This study was conducted to answer this question.

A total of eight full-size floor systems were tested in this study for their deflection and vibrational characteristics. In addition, four narrow floor specimens were tested to evaluate the impact of omitted bridging members on failure load and mode of floors. These test systems were built with 302mm (11 7/8") deep wood I-joists and an oriented strandboard floor sheathing. Construction details followed largely National Building Code requirements. In addition to the major objective of finding out if cross bridging can be similarly adopted for floors with wood I-joists, the experimental program was designed to evaluate the influence of parameters on the effectiveness of cross bridging. These parameters included joist spacing, number of rows of bridging and lumber strapping.

It was found that deflection and vibration levels decreased with the addition of bridging. Bridging was more effective in floors with close joist spacing than wide joist spacing. Increasing the number of rows of bridging from one to two (equally spaced) led to a large reduction in floor deflection but only a relatively small reduction in vibration levels. A large synergistic influence was achieved when a bottom lumber strapping was used in conjunction with cross bridging. This effect was particularly profound for systems with wide joist spacing. The current requirement of using two 57 mm (2 1/4,") nails at each end of a cross bridging member was found to be adequate if properly installed. Any weak fastening or omitted bridging member may lead to a large reduction in load-carrying capacities of floors, compared with properly fastened systems. The use of bottom strapping in conjunction with cross bridging, can however minimize this reduction.

Prepared by Y.H. Chui, Wood Science and Technology Centre, University of New Brunswick. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

HOUSING

CANADIAN HOUSING STATISTICS 1999 = STATISTIQUES DU LOGEMENT AU CANADA 1999

"Canadian Housing Statistics" is the definitive annual source book of current and historical information on housing. The publication is designed to bring together data relating to house-building and mortgage lending activity in Canada. Most of the data are derived from the operations of Canada Mortgage and Housing Corporation and from Statistics Canada. This comprehensive report places special emphasis on new housing construction, mortgage lending, construction costs and the demographics of housing demand.

Ottawa: Market Analysis Centre, Canada Mortgage and Housing Corporation, c2000.

Order number: 5958B **Price: $50.00 + GST and handling charges

AVAILABILITY : CMHC Information Products

FUTURE OF THE INTERNET AND THE HOUSING SECTOR

This study examines the extent of the usage of the Internet in the housing sector. It also briefly explains the Internet and its main features, the history of its general usage, growth worldwide and the opportunities it provides for the housing sector over the next few years. Trends associated with Internet usage are discussed for the following areas of the housing sector: housing construction; the real estate sector, housing financing and evaluation; governments and government agencies; industry associations and urban planning in general. The study provides a useful listing of housing-related Web sites in Canada and the United States in such areas as: institutional and government agencies; construction and architecture; real estate; financing and mortgage loans; planning and related specialties and co-operative housing.

Prepared by Syllable Internet Expressions Inc. Reviewed and supplemented by Florence Millerand. Prepared for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series: Research Report)

Order number: PE0317

NOTE : Aussi disponible en français sous le titre : Internet et le secteur de l'habitation de demain.

AVAILABILITY : CMHC Information Products

HOUSING AND POPULATION HEALTH: A REVIEW OF THE LITERATURE

This paper reviews the strength of evidence in the established literature that links housing to health, especially population health and comments on the state of the art.

The literature was screened for scientific robustness before the assessment. Two distinct categories of literature are apparent. The larger category has to do with chemical, biological and radiation exposures which occur primarily or frequently in the household setting. A smaller category has to do with sociological concepts and physical design. Overall, 24 housing exposures or factors were identified, leading to 40 health effects, about a quarter of them judged to be definitively or strongly linked.

All the definitive or strong links were found in the first category. Here, research methods come from the disciplines of environmental and occupational health and take place within an established theoretical framework involving quantitative exposure assessment, measurement of defined physiological parameters and health outcomes, and calculation of the dose-response relationship between exposure and outcome.

In the second category, research examines complex housing factors such as design and overcrowding that do not easily conform to an experimental model based on exposure to a physical substance. Socioeconomic status and its component parts were noted as a confounding variable which strongly influences both the health status of the individuals in a household and in the quality of their housing situation.

Generally, the research on the housing/health relationship has not established the relative importance of different housing factors nor looked at the interaction of factors. Methodological difficulties are associated with research which must span different types of disciplines.

There is a lack of a general theory of the mechanisms by which housing affects health. Population health research, while acknowledging the importance of the social and physical environment, rarely specifies housing. Very little attention has been paid to measuring how far, and in what way, better housing might improve public health.

Prepared by Centre for Applied Social Research, Faculty of Social Work, University of Toronto. Co-authors: Stephen Hwang . . . et al. CMHC Project Officer: Philip Deacon. Ottawa: Canada Mortgage and Housing Corporation, 2000.

AVAILABILITY : Canadian Housing Information Centre

HOUSING

HOUSING, SOCIAL INEQUALITY AND POPULATION HEALTH IN VANCOUVER NEIGHBOURHOOD AREAS

This study is a cross-sectional, survey-based investigation of relationships between housing, social inequality and population health in 13 Vancouver neighbourhood areas. Based on a model of the 'social determinants of health', the research examines relationships between differences in housing suitability, affordability, tenure, type, satisfaction, meaning, and neighbourhood social character on the one hand, and individual health status on the other, while controlling for age, gender, income, and ethnicity differences.

The major objectives were: to investigate ways in which social relations concerning housing and home contribute to the social production of health for individuals and to investigate ways in which housing (esp. affordability) and people's homes could act as a nexus for the production and reproduction of unequal social relations and social inequalities in health status.

Prepared by James R. Dunn. CMHC Project Officer: Philip Deacon. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Report) 84 pages

AVAILABILITY : Canadian Housing Information Centre

HOUSING AFFORDABILITY

AFFORDABLE HOUSING SOLUTIONS: FIFTEEN SUCCESSFUL PROJECTS

The project documented innovative approaches and 'best practices' for creating affordable housing from the Canadian non-profit and municipal housing sector. Fifteen case studies provide considerable detail on the strategies and means that were used by each of the groups to create affordable housing units. These involve new ideas in tenure such as Life lease, condominium, equity ownership and co-housing and also new ideas in financing such as partnerships, land leases, fundraising and others. All are explained in detail with specific project financing and client data. The reasons for success are listed and contacts with the lead organizations are given. The information in the report would be valuable to groups and organizations who provide or deliver affordable housing such as: housing cooperatives, non-profit organizations, charitable organizations, and municipal and provincial housing agencies.

Prepared by Deborah Kraus, Margaret Eberle, Joffre Pomerleau. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, c1999. (Housing Affordability and Finance Series Research Report) 125 pages

Order number: PE 0363

NOTE : Aussi disponible en français sous le titre : Solutions de logements abordables : quinze modèles de réussite

AVAILABILITY : CMHC Information Products

ALTERNATE TENURE ARRANGEMENTS

The objectives of this research were:

1. To develop a report on the range and types of alternate tenure arrangements that are currently available in Canada; and

2. To assess the extent to which housing projects using various types of alternate tenure arrangements are meeting residents' needs, preferences, and expectations.

The research included reviewing current literature on the range of alternate tenure arrangements that are available in Canada and carrying out 30 case studies of housing projects across Canada featuring various types of alternate tenure arrangements. The case study research involved visits to each of the projects, in-depth interviews with the project administrators and sponsors, and interviews with residents.

This report presents the results of this research and discusses and compares the various types of alternate tenure arrangements that are currently available in Canada. These include life leases, equity co-ops, leaseholds, and shared equity arrangements. The report also includes a discussion of cohousing, which is a newly emerging form of collaborative housing that can feature a variety of tenure types.

Prepared by David Scherlowski in association with Kathleen Mancer Consulting, DSI Tandem Coop Resources, Langlais et associés. CMHC Project Officer: David Scherlowski. Ottawa: Canada Mortgage and Housing Corporation, 2000. (Housing Affordability and Finance Series)

Note : Aussi disponible en français sous le titre : Modes d'occupation non traditionnels

AVAILABILITY : Canadian Housing Information Centre

GUIDE TO AFFORDABLE HOUSING PARTNERSHIPS

Today, partnerships have become more and more common in both the private and public sectors as a way of stretching limited resources and achieving strategic objectives. To help you work with other individuals and organizations to address housing needs in your community, Canada Mortgage and Housing Corporation has developed this guide. This guide is intended for individuals and organizations in the non-profit, public and private sectors who have an interest in providing affordable housing for families, single persons, seniors and people with disabilities.

A partnership in housing is an arrangement between two or more parties who agree to work together to achieve shared or complementary housing objectives. Partnerships in housing can be applied at different stages in the life cycle of housing creation - asset creation, maintenance or renewal. They may also be formed to solve housing problems and issues through program and policy development. Partnerships vary in their duration and in their level of formality. Partnerships in housing, except under federal and provincial housing programs, are a relatively new way of delivering housing in Canada. Nevertheless, an impressive number of initiatives have been undertaken or are currently underway. Examples of partnership approaches are given throughout the guide to help you gain a better understanding of the partnership process and how it can be applied to the provision of affordable housing.

Prepared by the consulting team of Linda Lapointe of Lapointe Consulting Inc., Lauren Millier and Greg Spafford of PricewaterhouseCoopers and Luba Serge. Ottawa: Canada Mortgage and Housing Corporation, 1999, c1998.

Order number: NE2216 **Price: $19.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Guide des partenariats de logement abordable.

AVAILABILITY : CMHC Information Products

GUIDE TO CREATING HOUSING TRUST FUNDS IN CANADA

This publication is a "how to" guide for those interested in establishing a housing trust fund (HTF). It provides advice on such topics as: making the first steps towards organizing to create a HTF; developing a proposal that addresses the potential administrative structure, funding priorities and revenue sources for the HTF; and, running a successful campaign to secure that finding source.

Prepared by Mary E. Brooks, Housing Trust Fund Project, Center for Community Change. Prepared in conjunction with Richard Drdla of Richard Drdla & Associates. Prepared for Canada Mortgage and Housing Corporation, Research Division CMHC Project Officer: David Scherlowski. Ottawa: CMHC, c2000. (Housing Affordability and Finance Series; Research Report) v, 36 pages.

Order Number: PE0407

NOTE : Aussi disponible en français sous le titre : Guide pour la création de fonds fiduciaires pour le logement au Canada.

AVAILABILITY : CMHC Information Products

HOUSING TRUST FUNDS: THEIR NATURE, APPLICABILITY AND POTENTIAL IN CANADA

A housing trust fund is essentially a locally-based organization that has secured a dedicated source of on-going revenue that is committed to the production and preservation of housing affordable to lower-income households.

This report examines the character and role of housing trust funds (HTFs) in the United States and their potential and applicability in Canada. It is presented in a number of parts: a review of the conditions in the U.S. that led to the establishment of HTFs; a summary of the recent American experience with HTFs, including discussion on funding sources, administrative structures and other key features; and, a number of profiles of particular HTFs in both countries that describe in greater detail their origins, sources of funding, administration and accomplishments to date.

U.S. housing trust funds profiled in the report include: the State Housing Initiative Program (Florida); Missouri Housing Trust Fund; Neighbourhood Housing Trust (Boston); Housing Trust Fund (Berkeley); Community Housing Trust Funds (Santa Fe); and, Community Housing Assistance Program (Boulder). Similar Canadian funds which are profiled include: Housing Reserve Fund (Saskatoon); Affordable Housing Fund (Vancouver); Employee Housing Service Charge Fund (Whistler); Reserve Fund for Affordable Housing (Banff); Housing Opportunity Partnership Loan Fund (Winnipeg). Proposed housing trust funds for Montreal, New Brunswick and Edmonton are also profiled.

Prepared by Richard Drdla Associates Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: David Scherlowski. Ottawa: CMHC, c2000. (Housing Affordability and Finance Series; Research Report) 100 pages.

Order number: PE0376

NOTE : Aussi disponible en français sous le titre : Fonds fiduciaires pour le logement: nature, applicabilité et potentiel au Canada

AVAILABILITY : CMHC Information Products

MUNICIPAL PLANNING FOR AFFORDABLE HOUSING

The purpose of this report is to better inform the housing and planning community of the land use planning and associated financial measures that can be used during the development approval process to bring about new affordable housing. These are: alternative development standards; density bonusing; inclusionary zoning; performance based planning and other flexible planning approaches; linkage programs; and, development cost charges on a unit size basis. A thorough description of each of the six measures is provided, focusing on their impacts on affordability. The study also describes some of the potential linkages among the measures and places them in the larger planning context. This final research report will be of interest to planners, municipal and provincial housing analysts, finance officers, and third sector housing providers.

Prepared by Ray Tomalty, Anna Hercz, and Peter Spurr. CMHC Project Officer: David Scherlowski, Ottawa: Canada Mortgage and Housing Corporation, 2000.

AVAILABILITY : Canadian Housing Information Centre

MUNICIPAL REGULATORY INITIATIVES: PROVIDING FOR AFFORDABLE HOUSING

This report examines three types of regulatory initiatives used by municipalities to provide for affordable housing. These consist of inclusionary zoning, a variety of exaction programs including linkage fees, and density bonusing -- also known as incentive zoning in many places.

All these initiatives rely on the development approval process to encourage, enable or require for-profit developers in some way to provide for housing affordable specifically to lower-income households. While only used to a limited extent in Canada, they have been increasingly used across the United States since cutbacks to federal funding in the early 1980s.

This report is intended to make the opportunities offered by these initiatives more widely known to local housing officials and others involved in the development of affordable housing in Canada.

The recent experience with these initiatives in both countries is reviewed, drawing upon both published and municipal reports as well as extensive telephone interviews. The findings are presented mainly through an overview of the three types of initiatives and profiles of two dozen of the most important of representative examples.

Prepared by Richard Drdla Associates Inc. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project officer: David Scherlowski. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series Research Report)

Order number: PE0326

NOTE : Aussi disponible en français sous le titre : Initiatives de réglementation municipales : production de logements abordables.

AVAILABILITY : CMHC Information Products

RESEARCH ON AN IMPROVED MEASURE OF AFFORDABILITY FOR ESTIMATING HOUSING NEED IN CANADA

This study was undertaken to assist the Federal/Provincial/Territorial Partners in their review of the standard for housing affordability used in estimating Core Housing Need. Specifically, the report examines whether there is an alternative measure that better approximates housing affordability needs across the country than the current fixed 30-percent Shelter Cost-to-Income Ratio (STIR).

The study was comprised of three major components:

- Examining the fixed 20-percent STIR norm in relation to actual shelter spending patterns;
- Exploring alternative variable-STIR measures which aim to treat households with differing circumstances more equitably than is the case under a fixed STIR; and
- Estimating the number of households in need under the alternative approaches.

Prepared by Clayton Research Associates Limited in association with Fuller Information. Prepared for John Engeland, Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1997. (Housing Affordability and Finance Series: Research Report)

Order No. PEO311

NOTE : Aussi disponible en français sous le titre : Recherche sur une mesure améliorée de l'abordabilité pour estimer les besoins de logement au Canada.

AVAILABILITY : CMHC Information Products

ROLE OF PUBLIC-PRIVATE PARTNERSHIPS IN PRODUCING AFFORDABLE HOUSING: ASSESSMENT OF THE U.S. EXPERIENCE AND LESSONS FOR CANADA

This report examines how public-private partnerships (PPPs) have emerged in the United States as a delivery vehicle for the provision of affordable housing.

The report first reviews the historical factors and circumstances that bred the PPP system. This evolutionary period is contrasted with the conditions that prevailed in Canada. Part 1 briefly reviews and presents a conceptual framework to describe the range of mechanisms and measures that are used to patch together affordable housing.

Part 2 then introduces and reviews a set of illustrative case studies that were used to examine, in greater detail, how affordable housing projects and partnerships are structured and packaged in the United States. The key features of affordable housing projects and PPPs are highlighted.

Part 3 provides a brief overview of the Canadian context and reviews a smaller set of Canadian case studies. The experience in each country is juxtaposed as a way to help understand the differences that exist and the potential of some of the U.S. approaches to be adapted to fill voids in the Canadian system.

An overall assessment of the U.S. experience and the opportunities to expand the production of affordable housing in Canada through PPPs are the subject of Part 4.

Three detailed appendixes contain, respectively, greater detail on the mechanisms, measures and roles of key partners (Appendix A); profiles of the 15 U.S. case studies (Appendix B); and profiles of the seven Canadian case studies (Appendix C).

Prepared by Steve Pomeroy, Focus Consulting and Greg Lampert, Economic Consultant, in association with James Wallace, Abt Associates, and Robert Sheehan, Regis J. Sheehan and Associates. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Manager: David Metzak. Ottawa: CMHC, 1998. (Housing Affordability and Finance Series Research Report)

Order number: PE0318

NOTE : Aussi disponible en français sous le titre : Le rôle des Partenariats Publics-Privés dans la production de logements abordables : Évaluation de l'expérience Américaine et leçons à tirer pour le Canada PF0318.

AVAILABILITY : CMHC Information Products

HOUSING AND IMMIGRATION

ETHNICITY AND CULTURE IN TENANT PARTICIPATION: AN ASSISTED HOUSING COMMUNITY IN TORONTO

This case study looks at possible barriers to community participation that are specifically related to cultural and ethno-racial diversity and suggests strategies that have the potential to enhance participation. The setting for the study is a government assisted housing project in Toronto where the residents include a large number of immigrant families from many different cultural backgrounds.

The study showed that most barriers to participation were linked to: a lack of knowledge about rights in the community, a perception that meetings were not effective and that nothing would be done, feelings of isolation, and7 lack of confidence especially among newer or smaller groups. However, these factors were not specific to any particular ethnic group and were not directly related to diversity. Some barriers which did have their origins in diversity were also noted.

The study concluded that, by and large, the main barriers resulted from different expectations among the actors (the residents' cultural groups, management, staff and youth) and the way an expectation of any one actor is perceived by the others. There were also many straightforward actions that could be taken that would help close the gaps in expectations, and that these could be combined into five strategic approaches centred on: meetings, information dissemination, relationship building, involvement of cultural groups, and involvement of youth.

Prepared by Irene Pereira. Ottawa: Canada Mortgage and Housing Corporation, 1998.

AVAILABILITY : Canadian Housing Information Centre

NEWCOMERS' GUIDE TO CANADIAN HOUSING

This guide is designed to answer newcomers' questions about renting or buying a house. It provides information about housing in Canada, sets out the nature and types of questions to ask landlords, building superintendents, real estate sales representatives, property managers and lenders and explains mortgages, interest, and the steps in buying a house, as well as the process of acquiring rental accommodation.

Ottawa: Canada Mortgage and Housing Corporation, c1999. (Housing Affordability and Finance Series)

NOTE : Aussi disponible en français sous le titre : Le Guide du logement au Canada pour le nouvel arrivant

AVAILABILITY : Canadian Housing Information Centre
NOTE: Copy available free from CMHC's web site:
http://www.cmhc-schl.gc.ca/publications/en/online1.html#newcomer
ftp://ftp.cmhc-schl.gc.ca/rd-dr/en/ah-la/newcomer.pdf

HOUSING DESIGN

FLEXHOUSING: HOMES THAT ADAPT TO LIFE'S CHANGES

FlexHousing in CMHC's answer to housing design that meets the changing needs of the occupant. This publication explains the key principles of FlexHousing essentially housing design that is adaptable, accessible and affordable.

This is a visually dynamic and attractive publication that features winning designs from CMHC's FlexHousing competition as well as examples of adaptable housing from around the world. The publication also includes information on FlexHousing systems and materials, costs and checklists. Sample floor plans are provided for many housing types including: singles, duplexes and multi-units.

This publication is suitable for consumers who are making a housing purchase decision as well as housing design and construction professionals.

Ottawa: Canada Mortgage and Housing Corporation, 1999. 72 pages.

Order number: NE2020 **Price: $9.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Bâti-flex: Un chez-soi adaptable.

AVAILABILITY : CMHC Information Products

PLEX HOUSING: A RENEWED TRADITION

This External Research Program report focuses on the Plex as an affordable and sustainable housing form. It traces its evolution and documents several historical types of it. The report appraises the Plex's advantages and proposes several design alternatives that would adapt it to the needs of contemporary households. The adapted Plex emerges as a flexible and economic form of housing most suitable for meeting the need for affordable housing. It is also an ideal form for infill and for more compact new neighbourhoods.

Original version prepared in French by Richard de la Riva, Suzanne Gagnon and Gavin Affleck. Translated by the CMHC. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

Note : Aussi disponible en français sous le titre : Les "plex" : une tradition renouvelée.

AVAILABILITY : Canadian Housing Information Centre

SINGLE ROOM OCCUPANCY HOUSING DESIGN STUDY AND CHARETTE

The City of Toronto and the Canada Mortgage and Housing Corporation (CMHC) jointly sponsored a three-phase research and design study on single room occupancy (SRO) housing for low-income singles. The three phases included:

1) a review of existing precedents, and code and by-law restrictions 2) the organization of a design charette, and 3) the preparation and financial analysis of design prototypes and a final report synthesizing all previous work.

This report represents the culmination of this research and design process. As such, it synthesizes the key findings of the first two phases of this study process, at the same time that it presents and costs several design prototypes.

Prepared by Planning Alliance. Prepared for the City of Toronto and the Canada Mortgage and Housing Corporation. CMHC Project Officer: Anna Lenk. Toronto: Planning Alliance, 2000.

AVAILABILITY : Available only on a loan basis from:
Canadian Housing Information Centre

UNIVERSAL DESIGN WITHIN THE HOME BUILDING INDUSTRY

Universal design refers to design solutions that respond to the range of the population to the greatest extent possible. It is a new way to think through the design of environments and products to ensure usability. It accepts that people are not "norms" but rather individuals with differing abilities, strengths, shapes, etc. Universal design is a global, all-encompassing effort to remove any and all barriers from the environment and to create accessible, comfortable, responsive spaces for the most extensive population possible.

This project focused on how universal design is perceived and how changes occur in the housing industry. The questions addressed in this research were:- What is known about universal design and its principles in the housing industry?- What are the influences that effect change in marketing and conventional construction in the housing industry?- What are the factors involved in the development and distribution of effective informational materials?

The results of the research indicated:- A lack of information and confusion about the term "universal design" in the industry and by consumers- While the housing needs of people with disabilities were considered, human functioning issues were not- There is a desire for more information on human functioning and the principles of universal design- Informational materials should be both interactive and print; be focused on the industry and be sent directly to individual members of the industry.

Recommendations from the report include the following:- The term universal design should become the recognized term in describing inclusive construction and buildings.- The inherent value free terminology of universal design be used in marketing and education.- A common terminology would be useful to both the industry and consumers.- Focused education to improve knowledge about universal design and its benefits is needed within the home building industry and information prepared must include details on human functioning and principles of universal design.- Interactive workshops, lectures, and demonstration projects are important to disseminate information within the industry.

Prepared by Gail Finkel with Yhetta Gold, George Fraser, and Ron Hambley. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

ADAPTING CANADIAN HOUSING TECHNOLOGY TO INTERNATIONAL MARKETS: DESIGN, MATERIALS, COMPONENTS AND STRUCTURES

Canada has one of the most diverse and successful housing industries in the world. Operating from this solid base, hundreds of companies with housing-related products, technologies and systems to offer are operating in foreign markets. Many are looking actively for additional export and investment opportunities abroad. To succeed, they pay attention to differences from Canadian norms in national and local standards, cultural traditions, design and quality expectations.

This report answers three main questions: do buyers in foreign housing markets accept what Canadian firms have "off the shelf" at present?; how are Canadian exporters already adapting to specific requirements of foreign customers?; and what future opportunities exist to increase market share by adapting housing-related products, technologies and services?

Based on Statistics Canada export data, many Canadian housing-related materials and products already enjoy widespread acceptance in many foreign markets. Exporters assure buyers of the quality of goods through a variety of means, and also compete effectively on price, availability, and timeliness of delivery. Nevertheless, significant opportunities remain to expand market share through adaptation to local taste, conditions and standards.

Experienced housing exporters are already strongly committed to and acting on the idea of adapting what they sell in foreign markets. They alter design, colour, finishing, quality, performance, dimensions, language of literature or other features, in some cases substantially. However, more needs to be done to facilitate exchanges of practical information on this topic among current and prospective exporters, resulting in significant gains in Canadian export success. Against Canada's very able competitors in international housing markets, every marketing tool that can be created for Canadian firms is needed. Advantages to be gained over other Canadian firms by clutching best practices in many foreign markets are fleeting, if they exist at all. While there are obviously some proprietary technologies and products and commercial-confidential "tricks of the trade", most product and service adaptations are readily evident from published company literature. The potential market is often so vast that there is plenty of room for everyone from Canada, despite possible perceptions to the contrary.

Foreign private sector partners and government research institutes are increasingly likely to become partners in "co-evolving" a version of Canadian housing technology to meet their own circumstances and needs in future. However, this approach to adaptation must be approached with care, so as to avoid difficulties caused in Japan, for example, where Canada is more noted as a source of quality, competitively-priced lumber, than as a supplier of quality whole-house systems.

Certain Canadian companies focus on products, technologies and services specifically suited to international markets alone, mainly for "low cost" housing. With a few exceptions, the latter appear to be having only modest success at present. The most productive avenue for the future may lie in the direction of investing in local ventures and technology transfer rather than exports as such.

The report concludes with handy lists of key questions for potential use by Canadian companies exploring entry into new international markets or seeking to increase market share. These take the user through an issue-by-issue or element-by-element review of potential adaptation requirements and considerations.

The report also contains contract information for experts in the field, and references for additional reading.

Prepared by C. David Crenna, The Bayswater Consulting Group Inc. CMHC Project Officer: Rob Duncan. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

ARE YOU READY TO EXPORT?

This guide deals primarily with exporting, more precisely, it will help you determine whether you are export-ready and will assist in identifying areas of strengths and weaknesses. The guide explains the three critical issues for anyone starting out in the export business: 1. Doing business at a distance;2. Doing business in a different environment;3. Dealing with risk.Chapters cover export readiness criteria; dealing with export related risks; choosing a target market and evaluating your export readiness through a self-evaluation tool.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 50 pages

NOTE : Aussi disponible en français sous le titre : Êtes-vous prêt à exporter?

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 50 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

Canadian Housing Information Centre.

BUSINESS GUIDE TO GERMANY FOR THE CANADIAN HOUSING INDUSTRY

This guide had been developed to help the Canadian housing industry do business in Germany. The guide covers many topics to help a variety of Canadian housing-related firms. The guide is divided into two parts. The first part focuses on market entry considerations. The second part describes all pertinent information in detail under major delivery factors: product qualification and certification; building regulations and building permits; access to property; construction workers; financing; German companies and taxation; the German customer; technology and know-how; marketing practices of housing manufacturers; and export logistics. An appendix provides addresses of prefabricated house manufacturers.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c2000. 62 pages

NOTE : Aussi disponible en français sous le titre: Guide destiné aux entreprises canadiennes faisant affaire en Allemagne

AVAILABILITY : Canadian Housing Information Centre

CHARACTERISTICS OF SUCCESSFUL HOUSING ALLIANCES

The purpose of this project was to document the successful characteristics and criteria that generally applied to any Canadian housing company wishing to export housing. This research was carried out in an effort to help companies enhance their success at exporting Canadian housing expertise. The report defines the characteristics of effective alliances and provides information on the following characteristics for success:

1. Ability to find financing; 2. Good people skills; 3. Competitiveness; 4. Networked market development.

The list of participants interviewed and copies of the survey instruments used are included in the report.

Ottawa: Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, c1999.

AVAILABILITY : On a loan basis only from:
Canadian Housing Information Centre

DOCUMENTING EXPORT FINANCING

This booklet is for the new housing exporter who is approaching a bank to finance an export transaction. You have a wonderful idea for an export project, you make an appointment with the bank, show the loans officer your product sheets, explain the export potential, yet the bank turns you down flat - because your company and the project were not well documented. This guide will help you with the preparation of both the application for financing, and the various financial instruments, with their accompanying export documents.

It is intended primarily for small to medium-sized housing product manufacturers who want to prepare the necessary documents on their company and export project for a lender and carry the transaction through to a successful conclusion.

Chapters 1-4 describe what you should look for in a lender, and what the lenders are looking for in your company and project; then provides a step by step outline of an Export Business Plan, an Export Financing Proposal and the major supporting documents with examples. This is followed by an outline of financing sources.

Chapters 5-7 begin by describing the methods of payment you can negotiate, with particular emphasis on documentary letters of credit (L/Cs)a short chapter on the Incoterms, and an outline of the shipping and other documents that must accompany the L/C.

The guide ends with a select annotated bibliography, a list of Internet resources and a glossary of export and documentary credit terms.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 94 pages

NOTE : Aussi disponible en français sous le titre : Documentation financière en vue de l'exportation

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 94 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

Canadian Housing Information Centre

EARTHQUAKE RESISTANT MODULAR HOME FOUNDATION SYSTEM

While Canadian manufacturers hold a significant share of the Japanese import housing market, they face increasing competition. One response is to introduce improved products which respond to Japanese technical and lifestyle concerns. This report explores such an approach involving improved earthquake resistant foundations which go beyond normal structural 'life-safety' protection to include 'continuing functional livability'.

The original hope had been to reconfigure the typical crawl space foundations to create a sliding slab arrangement whereby modular, panelized or conventional Japanese 2x4 export homes could "float" during an earthquake. However, this proved to be impractical.

The work then considered a variety of alternate strategies before adopting ground isolation utilizing seismic sliders. However, it proved necessary to introduce 200 mm thick pre-cast concrete slabs between the modules and sliders to preclude the light home from moving under Japan's design wind loads. The proposed designs were subjected to computer simulations of the 1994, Northridge; 1995, Kobe; and the 1977 San Fernando quakes. In all instances, the homes met the required earthquake resistance criteria.

Work also considered residential service connections, porches, steps and overhangs such as carport plus a potential closure system at the base of the home. Finally the concept was considered within the context of three-storey, wood-framed apartment buildings.

Costing analysis indicates that an earthquake resistant house foundation is roughly twice the cost of a conventional foundation, but adds only 3% -3.5% to the cost of a typical Japanese home while providing considerably higher protection. More importantly, an earthquake resistant foundation system actually appears less expensive than traditional non-protective foundations for wood-framed apartment buildings.

The work concludes with an analysis of the further research required to conclusively demonstrate the effectiveness of the seismic resistant foundation system in a modular home setting to an acceptable engineering certainty.

Prepared by B. Ian Bazley, Carlos E. Ventura and Jachym Rudolf. CMHC Project Officer: Rob Duncan. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

GETTING READY TO EXPORT

This guide deals primarily with direct exporting. More precisely, if you have identified your areas of strengths and weaknesses, it will guide you through the major steps necessary to improve your direct export readiness. Chapters 1 and 2 include a brief review of doing business abroad and your export readiness rating. Chapter 4 covers choosing between three possible objectives: survival, growth, or profit. Chapter 5 deals with the selection of a target market, while Chapter 6 covers the basic tools of the export trade. In Chapter 7, you will learn about overseas agents and in Chapter 8 the actual preparation of an export plan is covered. The remaining chapters ensure that you are prepared to do business and that you are "export-ready" for your first export business trip.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 115 pages

NOTE : Aussi disponible en français sous le titre : Comment vous préparer à l'exportation

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 58 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

Canadian Housing Information Centre

GROWING OVERSEAS THROUGH LICENSING AND FRANCHISING

There are four basic steps to doing business abroad: direct exporting; licensing and franchising; strategic alliances; and wholly owned subsidiaries. This guide is an introduction to international licensing and franchising and covers the following topics:-- Intellectual Property;-- What is Licensing?-- What is Franchising?-- International Licensing and Franchising Guidelines--Expanding Overseas Through Licensing and Franchising. It includes templates for license and franchise agreements and the main components of a franchise operating manual. The guide concludes with a list of useful references.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 88 pages.

NOTE : Aussi disponible en français sous le titre : Comment développer votre marché à l'étranger au moyen de licences et de franchises

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 88 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

Canadian Housing Information Centre

GROWING OVERSEAS THROUGH STRATEGIC ALLIANCES AND SUBSIDIARIES

This guide for the new housing exporter is an introduction to overseas alliances and subsidiaries. Its focus is on how to establish a direct, permanent presence in the overseas market. The first section of the guide explains that all alliances are not the same, describes various types of alliances, and outlines problems that can arise with alliances. The second section of the guide helps exporters prepare in advance for a strategic alliance. Part 1 of this section focuses on what should be done to be prepared ahead of time and covers patents, trademarks, copyrights, industrial designs, trade secrets, etc. Part 2 deals with how to negotiate from a position of strength and outlines some negotiating do's and don'ts. The guide concludes with a section on how to treat the alliance as a valued customer and with a chapter of useful references.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 70 pages.

NOTE : Aussi disponible en français sous le titre : Comment développer votre marché à l'étranger au moyen d'alliances stratégiques et des filiales

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 58 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

Canadian Housing Information Centre

HOUSING MARKET INTELLIGENCE STUDY OF JAPAN

Japan is one of the world's largest housing markets - housing starts averaged 1.5 million dwelling units annually during 1994-1997 period. This level of annual Japanese housing starts exceeds that of the United States over the same period (1.4 million) and dwarfs the 134,000 average annual starts in Canada.

Much of the market for housing products and services in Japan relates to the construction of single-family housing, which comprises roughly half of the country's total annual housing starts. Many countries including Canada are aggressively targeting Japan as a market for housing-related exports.

Access to market information and research expertise represents an important barrier to Canadian housing firms that are seeking to explore export opportunities in Japan.

This report comprises Phase 1 of a two-phase attempt to assist in this regard. Commissioned by the Canadian Housing Export Centre (CHEC) within Canada Mortgage and Housing Corporation (CMHC), the report highlights the availability, sources and quality of housing market information in Japan. The intent is to inform the Canadian housing industry about how to access important information on the Japanese market.

The Phase 2 study will provide an analysis of prospects for Canadian exports and an analysis of the penetration of imports into this market.

Ottawa: Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, 1999.

NOTE : Aussi disponible en français sous le titre : Informations sur le marché de l'habitation au Japon.

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 47 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

INTERNATIONAL FINANCIAL INSTITUTION (IFI) PROCUREMENT

This guide is for the small to medium-sized housing exporter (SME) who is interested in selling products or services to projects funded by the six International Financial Institutions (IFIs) in developing countries. Canadian housing product manufacturers have not been getting their fair share of goods and services procurement in this important market. This guide is intended to help chart a path to greater IFI procurement success for Canada's new housing exporters.

Chapter 1 describes the IFIs and what they do. Chapter 2 outlines Canada's track record in IFI procurement and some advantages to entering the market. In Chapter 3 the IFI project cycle and procurement process are described, while Chapter 4 outlines the bidding process and how to survive it. Chapter 5 describes several large IFI projects, then outlines some procurement announcements and contract awards to show how the IFIs operate. Chapter 6 sets out where the government assistance is - the IFI Procurement Specialist Network, a recent initiative. Chapter 7 discusses the recommendations of the Task Force on IFI Procurement. Chapter 8 contains a detailed checklist for firms interested in bidding on IFI-supported projects. Chapter 9 outlines the banks' procurement procedures. Chapters listing key contacts, addresses and Internet sites as well as Glossary and Bibliography complete the guide.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 59 pages

NOTE : Aussi disponible en français sous le titre : Comment traiter avec les institutions financières internationales

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 59 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

Canadian Housing Information Centre

INTERNATIONALISATION DE LA FILIÈRE HABITATION: UNE ANALYSE PERCEPTUELLE

In the rush of the global trade, an increasing number of Canadians firms are looking to foreign markets, and the housing industry is no exception. As domestic demand is down over previous years, prospecting new markets outside the country, is an avenue firms are increasingly less hesitant to explore. To date, however, the housing industry does not have its rightful share of exports, given its size in the Canadian economy.

This study is primarily a qualitative study based on about forty extensive interviews of corporate executives operating in three sub-sectors of the housing industry: professional construction services (builders, engineers, architects, etc.), manufacturers of building products and manufacturers of pre-fab homes. The interviews were conducted with firms from all corners of Canada. The purpose was not so much to identify the objective export-related difficulties as it was to see how corporate executives perceived these difficulties.

The study's conclusions are the following:

1. Firms generally tend to underestimate the difficulties, constraints and barriers related to international commerce.
2. For business, one of the main challenges in international business is delivering the product and the service within the required timeframes.
3. Corporate executives do not fear market globalization.
4. Few firms are concerned with diversifying their markets.
5. Businesses in the housing sector are not very familiar with the competition in target markets abroad.
6. Building systems which use wood have a harder time penetrating foreign markets.
7. Firms are reserved with respect to government assistance.

Prepared by François Cadotte. CMHC Project Officer: Joanne Hallé. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

NEGOTIATING WITH THE BUYER

This guide provides some practical approaches to international negotiation for the new housing exporter, particularly the housing product manufacturer preparing to negotiate a first sale abroad. In the process, the guide also provides assistance for more complex export negotiations, such as joint ventures or the export of services. New Canadian exporters, who may be excellent negotiators on their home turf, need assistance in dealing with what is different in export negotiation: a variety of business cultures and approaches to negotiation, bargaining in particular.

Chapter 1 shows how to prepare for negotiation. Chapter 2 describes and illustrates practical negotiation. Chapter 3 offers a number of case studies from a survey of industry senior executives on their negotiation practices, while Chapter 4 provides an introduction to the negotiating styles of several foreign cultures. Chapter 5 presents an introduction to the main export contracts, an outline of the sequence from quotation to the completion of the contract, and important clauses to include in it; Chapter 6 describes the Incoterms. An annotated bibliography and Internet sites complete the guide.

This guide assumes that the exporter has completed the process of marketing, selected a target market (see the guide titled Getting Ready to Export), ensured proper financing (see the guide titled Documenting Export Financing), screened the buyer and market (see the guide titled Screening the Buyer) and is now ready to negotiate the first international sale.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 49 pages

NOTE : Aussi disponible en français sous le titre : Comment négocier avec les acheteurs.

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 49 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

Canadian Housing Information Centre

OUTLOOK STUDY ON HOUSING MARKETS IN THE UNITED STATES

This report on the United States housing market includes four distinct areas of analysis. They are:

1. Regional Overview: a summary of the building activity and demand-supply balance in the largest markets across the country.
2. Homebuyer Profiles: a summary of the typical buyer profiles and how those profiles differ in each region of the country.
3. Materials Purchasing: a summary of the materials demanded and the criteria used to select supplies.
4. Design Centres: an overview of how design centres are changing the way homes are built and sold.

Prepared by The Meyers Group. Prepared for the Canadian Housing Export Centre, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999. 64 pages

NOTE : Aussi disponible en français sous le titre : Étude de perspectives sur les marchés de l'habitation des États-Unis

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 64 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

POTENTIAL FOR BUILDING PRODUCTS CO-VENTURES, EXPORTS AND CANADIAN EXPERTISE FOR SUSTAINABLE HOUSING DEVELOPMENT IN CHINA

This report provides an overview of urban development and housing in China with information on:

- Changing demographics and the new economy;
- A typical new housing project in urban China;
- Regional differences;
- Home ownership in China; and
- The state of residential building technology and construction in urban China.

This study identifies the range of construction materials, products and services related to sustainable development that could be utilized by China's housing industry. In particular, it has identified the following key areas for export/co-venture opportunities in China: - site remediation - lightweight non-combustible systems and materials - alternatives to clay brick - production facilities for cement, reinforcement, structural steel and coated steel; and - interior products ranging from painting and decorating supplies to communication and security systems and wiring components.

A table listing typical pricing information for various building products and materials supplied in China is included.

Prepared by Urban Ecology Design Collaborative. Prepared for Canadian Housing Export Centre, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999.

AVAILABILITY : Available only on a loan basis from:
Canadian Housing Information Centre

SCREENING THE BUYER

This booklet is for the new housing exporter who receives an unsolicited expression of interest from an unknown foreign buyer. You may be a builder, a manufacturer of housing products or a service provider. In the middle of a busy day, someone from Russia or Japan or Jamaica calls your order department. He says his company is interested in buying a quantity of your product or service, and asks for a price quotation.

What do you do? Do you take time to deal with what may be a frivolous call, or do you ignore what could be a serious inquiry? Is there a way to deal systematically with all such unsolicited expressions of interest? This booklet will help you develop 1) a method to screen foreign inquiries, eliminate spurious or casual requests and focus on the serious ones and 2) a general approach to answering foreign inquiries quickly and appropriately, without waste of time or resources.

Chapter 1 organizes the questions to ask to get information on the unknown country, housing market, and buyer. Chapter 2 outlines a rough screening "rule of thumb" based on the type of market as a guide to creditworthiness. The use of the Screening Questionnaire is explained. Chapter 3 shows how to prequalify the creditworthy buyer and is based on the experience of successful Canadian exporters. Chapter 4 presents a description of the process used by four successful Canadian housing exporters in dealing with an expression of interest from a foreign buyer. The guide ends with a comprehensive list of free and commercial resources.

Ottawa: Canada Mortgage and Housing Corporation, Canadian Housing Export Centre, c1998. (Guides for the New Housing Exporter) 59 pages

NOTE : Aussi disponible en français sous le titre : Comment évaluer les acheteurs éventuels

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 59 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library. Canadian Housing Information Centre

STUDY OF FACTORY-BUILT HOUSING MARKET OPPORTUNITIES IN SOUTHEASTERN U.S.A.

The purpose of the first of this two-part study was to investigate the potential niche markets open to Canadian manufacturers of factory-built housing in the Southeastern United States. Produced in late 1998, the report provides a substantive examination of the housing markets in Alabama, Georgia, Mississippi, North and South Carolina, and Tennessee. The author of the report states that these specific housing markets were targeted because this particular geographic area is experiencing strong economic growth and that this market is currently a fragmented residential construction market.

Data were collected through research tools such as telephone and personal interviews, analysis of previous research and demographic information on the primary geographic market.

The research reveals there is a growing market for wall panels, as well as timber frame and log homes. A number of US builders interviewed for this project expressed an interest in developing a working relationship with Canadian manufactured housing firms.

Ottawa: Canadian Housing Export Centre, Canada Mortgage and Housing Corporation, 1999

NOTE : Aussi disponible en français sous le titre : Étude sur les débouchés pour les maisons usinées dans le Sud-Est des États-Unis.

AVAILABILITY : Available in PDF file on CMHC's Web site. To download this 58 page document visit CMHC's Web site at www.cmhc-schl.gc.ca, click on the Export Opportunities section and browse through the library.

TRENDS IN THE JAPANESE HOUSING MARKET: PRELIMINARY SUMMARY

Japan is one of the world's largest housing markets. Canada is a leading exporter of building materials and services to Japan and has actively promoted the use of Canadian housing systems through a variety of initiatives. Imports of housing, however, comprise only a small proportion of total Japanese housing activity so the potential to expand this market share presents attractive opportunities for Canadian housing producers and suppliers. This 6 page summary provides 1. an overview of recent trends in the Japanese housing market and housing imports; 2. a preliminary assessment of market opportunities for Canadian housing companies in Japan; and 3. identifies a number of potential market niches including:-- large-scale wooden buildings;-- exterior finishes on buildings in quasi-fire protection areas;-- energy-efficient and healthy housing;-- housing for the elderly; and-- the renovation market.

Prepared by Greg Lampert Economic Consultant and Cyber Builders International, Tokyo Kagoshima Edmonton. Prepared for Canadian Housing Export Centre, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999. 6 pages

NOTE : Aussi disponible en français sous le titre : Tendances du marché de l'habitation au Japon : résumé

AVAILABILITY : Canadian Housing Information Centre

DEMAND PROFILES FOR HIGHER-DENSITY HOUSING

This study examines the relationship between building types as defined by the relative density of projects and household characteristics. It uses the 1991 Census Public Use Micro Data Files (PUMF) to identify the characteristics that distinguish the demand for four types of dwellings:

- the single-family house;
- the duplex, row, semi-attached and attached options that will be referred to as the duplex and townhouse option;
- the under five-storey apartment building; and
- the highrise apartment.

It considers households as formed by couples with children, couples without children, lone parents, and people living alone or with other unrelated people.

The aim is to develop profiles describing the characteristics of households generating the demand for units in higher-density building types and to identify target populations whose entry into the medium-density housing options would contribute most to the goal of making our cities more compact while maintaining a reasonable level of risk in the marketing of units.

The study starts by examining the 1991 census data to describe the households and housing options of Ottawa residents. It links the propensity of the different household types to occupy each of the four buildings types with the Canada Mortgage and Housing Corporation (CMHC) long-run projections of households for the Ottawa region. These projections form a basis for the discussion of how changes in income and housing prices may affect future demand. The role of the existing stock is discussed and a base-line projection developed for the proportion of future housing starts that will be in higher-density buildings. The study concludes by describing household profiles that can serve as targets for the development of new higher-density housing options.

Prepared by Andrejs Skaburskis. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Fanis Grammenos. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series)

Order number: PE0341

NOTE : Aussi disponible en français sous le titre : Profils de la demande de logements de secteur à haute densité.

AVAILABILITY : CMHC Information Products

ÉTUDE DES CYCLES DE L'EMPLOI ET DES MARCHÉS DE L'HABITATION

This report comprises three parts. The first part reviews the literature on the interaction between the labour market and residential real estate activity. The authors are particularly interested in the cyclical relations through which the situation on the labour market influences the residential construction and home resale trends. They are also seeking to identify any new trends observed on the labour market or elsewhere that could have changed the nature and scope of the interactions between the labour market indicators and the residential real estate activity indicators.

The second part presents the strategy that the authors intend to use to estimate the elasticities of the employment indicators on housing starts and MLS sales. They justified the choice of the indicators and the choice of the methods.

The object of the third part is to present the empirical results concerning the elasticities of the residential real estate activity indicators in relation to the employment indicators. The work consisted in verifying and specifying how the signals (informational content) emitted by the labour market indicators could serve to forecast changes in residential real estate activity as measured by housing starts and MLS sales.

Prepared Yvon Fauvel, Alain Paquet, Christian Zimmermann. Montréal: Centre de recherche sur l'emploi et les fluctuations économiques □, Université du Québec à Montréal, 1999.

AVAILABILITY : Available only on a loan basis from:
Canadian Housing Information Centre

HOUSING MARKETS IN BC RESOURCE COMMUNITIES: CASE STUDIES FROM THE 1980S TO THE 1990S

This report examines how the cycles of the resource sector impacts the housing markets in six resource-dependent communities in BC. The selected communities and their primary resource base are: Port Alberni - Forest products; Prince George - Forest products; Prince Rupert - Forest products and fishing; Fort St. John - Oil and gas; Trail-Rossland - Mining; and Kelowna - Diversified.

The stages of the study included:

- A literature search on housing models at the regional level.
- A historical review of the communities' economies and the housing market.
- The estimation of multiple-regression models for the housing market variables, single-family house (SFD) prices, single-family house sales, single-family housing starts and total housing starts using EViews.
- Testing of the regression models for structural consistency over subsets of the sample period.
- The estimation of ARIMA models for the housing markets.
- A comparison of the modeling and forecasting capabilities of the regression models for the ARIMA models.
- Base case simulations for the community housing market variables out to 2004.

HOUSING MARKET

The purpose of the study is to provide CMHC with a methodology that would permit simulations of significant discrete outlooks for various resource sectors on the housing markets of known resource-dependent communities. The methodology could become another tool used for strategic planning and risk analysis.

The conclusions of the study are:

- There is virtually nothing in the literature that investigates the relationships of housing markets to economic or resource cycles at the micro regional level like in this study.
- The housing markets of resource-dependent communities are significantly impacted by resource cycles.
- Typically, resource production variables were more important than resource prices in impacting housing markets.
- The housing cycles tended to be much longer and more severe than resource cycles, possibly due to major stock adjustments required in the housing markets as a consequence of dramatic structural changes forced on BC's resource industries.
- The regression models' coefficients, with few exceptions, were stable as determined by various stability tests.
- The regression models capture most of the dramatic adjustments in the housing markets since the late 1970's.
- In general, the quality of the model results are positively correlated with the size of the communities.
- The best model results were for house prices, followed by single-family starts, single-family home sales, and then total starts.
- The regression models are superior to the ARIMA models in replicating history, tracking major turning points, and in forecasting accuracy.
- The methodology is widely applicable to other resource-dependent communities.

The study results provide a valuable tool for assessing the degree of risk facing housing markets in resource-dependent communities.

Prepared by G.A. Pedersson & Associates. CMHC Project Officer: Joel Starkes. Ottawa: Canada Mortgage and Housing Corporation, 2000.

AVAILABILITY : Canadian Housing Information Centre

HOUSING TRANSITION IN SINGLE INDUSTRY 'INSTANT TOWNS'

Single-industry communities are a common part of the Canadian rural landscape. In many cases, these communities were developed by a single firm or industry to provide a focal point for local extraction and/or processing operations, as well as to house the needed workforce. Often isolated from other communities, the local housing market is influenced by the health of the resource industry. As a result, changes in the viability of the industry affect the local housing market. Restructuring pressures within the resource sector have led to a re-evaluation of the viability of constructing new, and in some cases maintaining old, single industry communities. This research examines two single industry "instant towns" in Canada with the purpose of tracking transitions within the local housing market as the economic fortunes of the local industry and community change through time. An understanding of these isolated markets is needed to inform government policy and will be useful to resource companies seeking to evaluate new development costs, to local decision-makers interested in community development, and to households participating in the housing market.

The research was based on a comparative study of Mackenzie and Tumbler Ridge, British Columbia. The scope and objectives of the research were fourfold:

1. To develop an historical and contemporary portrait of the local housing market in these single-industry instant towns.

2. To identify and track the timing of past corporate strategies with respect to the selling off of housing stock to employee residents.

3. To identify the nature and scale of economic benefits or costs which may accrue to households through housing purchase in this type of community context.

4. To identify the nature and scale of economic benefits and costs which may accrue to institutions such as the resource development corporation or Canada Mortgage and Housing Corporation.

The research methodology involved 6 stages. These included a background literature review on previous work on this topic, development of baseline housing data and a local housing history for each community, a review of local housing construction activity, a summary of changing housing investment values, and an analysis of the collected information.

Prepared by Greg Halseth and Lana Sullivan. CMHC Project Officer: David Scherlowski. Ottawa: Canada Mortgage and Housing Corporation, 2000 (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

WHISTLER HOUSING MARKET

The objective of the research was to investigate the evolution of the housing market in the Resort Municipality of Whistler, which has emerged as the most expensive housing market in Canada. The median price of single family homes sold in the first quarter of 2000 was $662,000, up 21% from the median price recorded in the last quarter of 1999.

In 20 years, Whistler has grown from a handful of residents to almost 10,000. The number of visitors has also grown exponentially - more then 2 million skier visits were recorded in the 1999 ski season. Almost 85% of Whistler's population is under the age of 45 in contrast to only 67% of the B.C. population. The population over the age of 65 represents just 1% of Whistler's population, compared to 13% of the B.C. population. About 57% of all households in Whistler are renters, compared to 34.5% of the B.C. population.

The housing market in Whistler is complex with 11 different housing types and tenures: hotels; condominium hotels, townhouses, single family residential where tourist use is not permitted; single family residential where tourist use is permitted; quarter-shares; auxiliary suites; timeshares; campgrounds; parking lots; and resident housing.

High housing prices in Whistler result in 20% of Whistler employees living in the more affordable communities of either Squamish or Pemberton which are more than 30 minutes commute by car. Overall, about 53% of property owners in Whistler live in the Vancouver area, 25% are Whistler residents and 2% live in other parts of B.C., meaning that 90% of registered property owners live in B.C. However, purchases by international buyers are increasing, so the proportion of B.C. ownership is likely to decline in the future.

Whistler housing has market appeal due to increasing international exposure, the prestige value of owning Whistler real estate, the lack of good snow in Colorado ski resorts over the last two years, the low Canadian dollar, better flight connections to and from Vancouver International Airport, improved infrastructure (more and better ski lofts and golf courses), new hotels that advertise heavily for an international and wealthy clientele, and, importantly, the Internet, which has revolutionized resort marketing.

Whistler has instituted a development cap in its Official Community Plan that will likely be reached in 3 years. Unless the cap is modified, demand will surpass supply and house prices will invariably increase. Some real estate professionals are anticipating Whistler home prices comparable to the internationally-renowned ski resort at Aspen, Colorado, where home prices are about three times the level of Whistler prices.

If the Vancouver-Whistler bid for the 2010 Winter Olympics is successful, the experience of other Winter Olympic cities indicates that the impact on the housing markets of Whistler will be minor. Probably the most significant item of infrastructure as far as Whistler (and Squamish) are concerned would be transportation improvements between Vancouver and Whistler. It is probable that the impact of the Winter Olympics would be more significant for Squamish and Pemberton than for Whistler. Whistler is already very well known on the world stage, unlike either Squamish or Pemberton.

Prepared by Kathleen Mancer, Kathleen Mancer Consulting in association with Pip White, Urban Aspects Consulting Group. CMHC Project Manager: Charles King. Ottawa: Canada Mortgage and Housing Corporation, 2000.

AVAILABILITY : Canadian Housing Information Centre

ACHIEVING HEALTHY INDOOR ENVIRONMENTS: A REVIEW OF CANADIAN OPTIONS

CMHC participated in this partnership initiative developed and led by Pollution Probe. The objective of this project was to establish the current state of regulation of the indoor environment - residential, commercial and institutional - in Canada and to identify barriers and approaches to enabling the promotion and achievement of healthy indoor environments. The project reviewed and analysed existing regulatory and voluntary programs which have an impact on the indoor environment, both in Canada and internationally. The project scope covered four distinct areas - buildings, products, services and processes, and identified barriers to the creation of healthier indoor environments, gaps in present knowledge, and opportunities for voluntary initiatives. Through consultation with industry, government and other key stakeholders, the most instructive initiatives were evaluated to identify key success factors and for their potential as voluntary initiatives which can compliment and/or supplement existing regulatory measures.

Prepared by Ian Morton of Pollution Probe and Jay Kassirer of Cullbridge Marketing and Communications. CMHC Project Officer: Thomas Green. Toronto: Pollution Probe, 2000.

AVAILABILITY : Pollution Probe Foundation
625 Church Street
Toronto, ON. M4Y 2E8

EFFECT OF IMPROVING THE HOME ENVIRONMENT ON ASTHMA: A PILOT STUDY

Six houses having one or more individuals suffering from asthma and in which the occupant's symptoms are linked to the house were inspected following the CMHC Residential IAQ Investigation Protocol. All houses were found to be severely moldy. The houses were subjected to tests for various indoor air parameters - CO2, VOC's, dust mite allergens and molds. Mold tests confirmed the inspection findings. Five of the homeowners proceeded with a remediation. Compliance with recommendations of the study varied from partial to full. The health status of the asthmatic occupants was monitored during the study. Health improvement of the occupants correlated qualitatively with the degree of improvement of the air quality of the houses.

Order number: PE0362

NOTE : Aussi disponible en français sous le titre : Effet sur l'asthme d'une amélioration du milieu intérieur résidentiel : étude pilote.

AVAILABILITY : CMHC Information Products

GUIDE TO MECHANICAL EQUIPMENT FOR HEALTHY INDOOR ENVIRONMENTS

This publication summarizes current information on heating (both space and hot water heating), cooling and ventilation systems and equipment used in low-rise, residential buildings with regards to their effect on indoor air quality. An additional discussion of water purification systems is also presented. The publication is intended to be an information source primarily for environmentally hypersensitive individuals and, second, for the general public and the home-building industry as a reference on mechanical systems.

The document provides background information for the reader by presenting definitions of specialized terminology used in the publication and with a discussion of a house as a system. This latter discussion shows how the operation of mechanical equipment and the indoor air quality in a home are affected by other elements such as insulation, air barriers and the types of interior finishes used.

Various types of heating, cooling, ventilation and air filtration systems are presented with a discussion of how they affect the indoor air quality of a home. Retrofitting existing heating systems to improve the indoor air quality is also addressed. A discussion focused on the specific needs of the environmentally hypersensitive is presented at the end of each section.

This report concludes with a section on water quality and the types of water treatment systems available for residential applications. The appendices contain lists of suppliers of heating, cooling, ventilation and water treatment equipment indexed both by type of equipment and by supplier.

Prepared by David Rousseau, Dara Bowser and Chris Mattock. CMHC Project Manager: Virginia Salares. Ottawa: Canada Mortgage and Housing Corporation, 2000. (Healthy Housing and Communities Series Research Report) 140 pages

Order number: PE0372

NOTE : Aussi disponible en français sous le titre : Guide d'équipement mécanique pour un environnement intérieur sain.

AVAILABILITY : CMHC Information Products

INVESTIGATION OF BLACK SOOT STAINING IN HOUSES

This study was designed to investigate sooting problems in houses where occupants reported regular burning of candles. Samples of stained carpets, filters and other materials as well as swab samples of black dust or soot were taken from five homes. In addition, samples of commonly burned candles in the homes were burned in a laboratory. The objective was to try and match the soot from the candles burned in the laboratory to the materials found to be staining components in the houses. Various laboratory techniques were used to try and establish a practical, cost effective test protocol for identifying soot. In addition, a thorough indoor air quality audit was conducted on each home to identify other potential pollutant sources and contributing factors. This information could provide IAQ investigators with diagnostic and testing techniques that would help them corroborate or prove to clients the pollutant source of the streaks and stains in their homes. The study also included a search of industry information to uncover best practices for clean up and control of soot staining problems.

Prepared by Gord Cooke, Air Solutions Inc. CMHC Project Officer: Don Fugler. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

ALTERNATIVE METHODS OF FINANCING MUNICIPAL INFRASTRUCTURE

This paper is intended to serve as a backgrounder for two related studies on financing municipal infrastructure:

- Provision of Municipal Infrastructure Through Demand Management: Guidebook and Case Studies
- Public-Private Partnerships in Municipal Infrastructure

In the view of many observers, there has been insufficient, and in some cases inappropriate, investment in Canada's urban infrastructure over the last two decades. Much needed maintenance and repair in existing urban areas are often deferred in favour of infrastructure expansion to new communities on their fringe. The result has been gradually deteriorating facilities in already built-up areas, and a dispersed urban development pattern that is increasingly expensive to service. With other priorities such as health care and education, competing for scarce tax dollars at all levels of government, many municipalities are looking at alternative methods of financing urban infrastructure.

This paper looks at some of the issues surrounding infrastructure finance, including the importance of quality urban infrastructure, the perceived expenditure gap in existing facilities, estimated investment requirements and the efficiency of current development patterns. Based on the assumption that a variety of financing tools are required to supplement government-financed infrastructure, the paper provides an overview of alternative financing mechanisms ranging from development charges and special district financing to user charges and trust funds.

This paper draws on studies presented at a workshop held at the University of Western Ontario in June 1992: Infrastructure and Housing - Challenges and Opportunities. The workshop was co-sponsored by CMHC and the Canadian Home Builder's Association.

Ottawa: Canada Mortgage and Housing Corporation, c1999 (Housing Affordabilty and Finance Series)

Order number: PE0368

Note : Aussi disponible en français sous le titre : Les différents mécanismes de financement de l'infrastructure municipale, PF0368.

AVAILABILITY : CMHC Information Products

PROVISION OF MUNICIPAL INFRASTRUCTURE THROUGH DEMAND MANAGEMENT: GUIDEBOOK AND CASE STUDIES

This paper is the second in a series of three Canada Mortgage and Housing Corporation (CMHC) studies looking at infrastructure finance. This paper looks at the ability of demand management (DM) measures to contribute to meeting future water and wastewater infrastructure demands.

Demand management (DM) deviates from traditional water and wastewater system planning by focusing on what causes the demand for water and wastewater services. DM looks at why peaks occur and how to reduce them. The approach focuses on shaping demand, as a precursor to meeting demand.

Part I of this report (the Guidebook) introduces DM, describes DM techniques and identifies how to tailor DM programs to the needs and goals of specific communities. It introduces tools that can be used by planners, engineers and administrators to reduce water use and wastewater flow, including the reduction of systems losses due to leaks and the reduction of wastewater flow due to inflow and infiltration. The Guidebook then discusses the engineering considerations of water and wastewater conveyance and treatment systems which assist in ensuring that public health and the environment are protected. The goal is to provide a balanced perspective of DM considering risks, effectiveness and costs. While DM is not identified as a panacea, it has a role and this role is identified.

Part II of the report (the Case Studies) profiles DM initiatives in the following communities:

- City of Barrie, Ontario;
- City of Edmonton, Alberta;
- Greater Vancouver Regional District, British Columbia;
- Communauté Urbaine de l'Outaouais, Quebec;
- Regional Municipality of Ottawa-Carleton, Ontario;
- Town of Port Elgin, Ontario;
- City of Regina, Saskatchewan;
- Regional Municipality of Waterloo, Ontario; and
- City of Windsor, Ontario.

It is hoped that the Guidebook and Case Studies will encourage readers to further explore DM opportunities for their communities. Resources and references are identified throughout to assist those interested in pursuing this topic.

Prepared by CH2M Gore & Storrie. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: David D'Amour. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series)

Order number: PE0353

NOTE : Aussi disponible en français sous le titre : Production des équipements d'infrastructure municipale par la régulation de la demande : guide et études de cas

AVAILABILITY : CMHC Information Products

PUBLIC-PRIVATE PARTNERSHIPS IN MUNICIPAL INFRASTRUCTURE

Adequate, efficient and well-maintained municipal infrastructure is one of the key components of a viable, prosperous economy, and a significant determinant of quality of life. As competition for scarce resources at all levels of government increases, infrastructure upgrades and expansion are becoming increasingly difficult to finance.

This paper is the third in a series of three CMHC studies looking at infrastructure finance. It explores the potential for public-private partnerships to fund the provision, operation and maintenance of municipal infrastructure. This paper examines the private sector's involvement in urban infrastructure. The study looks at the impacts of public-private partnerships on service costs and quality and examines whether privatization reduces costs to existing and new homeowners. It looks at different partnership models, discusses their strengths and weaknesses and presents a number of case studies, shedding light on which models are most appropriate under which conditions.

Contributing consultants: IBI Group, Dillon Consulting Limited, The Acumen Consulting Group, Lapointe Consulting, Paterson Planning and Research Ltd. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: David D'Amour. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series: Research Report)

Order number: PE0352

NOTE : Aussi disponible en français sous le titre : Les partenariats public-privés en matière d'infrastructure municipale.

AVAILABILITY : CMHC Information Products

ASSESSING THE ADEQUACY OF RESIDENTIAL LIGHTING IN TWO CARE CENTRES FOR PERSONS WITH ALZHEIMER'S DISEASE: USING THE NEW AGE-ADJUSTED NORTH AMERICAN ILLUMINATION STANDARDS: RECOMMENDATIONS

This study extends current knowledge on the design of residential settings for elderly persons by comparing and assessing the suitability of lighting levels in two nearly identical sites for persons with Alzheimer's disease in Edmonton, Alberta. In addition to the centres' lighting levels being contrasted, they were also compared with the new age-adjusted lighting recommendations of the Illuminating Engineering Society of America IESNA Goals included determining the effectiveness of the lighting design differences at McConnell Place West (MPW), where lighting was enhanced compared to McConnell Place North (MPN), and to determine if any behavioural differences in the two settings might be attributed to lighting levels. The physical attributes of the two centres (such as differences in colour of walls and floors, etc.) were fully described to investigate how much of the variance between the two centres was attributable to natural daylighting through windows, rather than to light intensity and known characteristics of the artificial illumination. Staff members and family members were asked if they were satisfied with lighting levels, and in addition, residents' utilization of public areas in MPW and MPN was determined through systematic direct observation.

Objective measurement indicated the MPW met the IESNA recommendations in most respects, whereas MPN did not. In many areas, MPW had more than four times the lighting levels found in parallel areas of MPN. Whereas the enhanced lighting in MPW did not dramatically influence the location of resident programs, staff satisfaction with lighting for various activities was in most respects significantly higher at the centre with enhanced lighting. Family members liked the residential-style lighting in both sites. Results indicated that design professionals should consider more carefully the function of each space in order to ensure that appropriate lighting is available for each function. Problems with strong direct sunlight in one centre suggest they also need to provide strategies for controlling light in rooms that receive substantial amounts of such light.

Principal Investigator: Doris Milke. Team members: Caroline Clark and Monica Bucknell. CMHC Project Officer: Virginia Salares. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

MANUFACTURED HOUSING

REVITALIZATION OF THE MANUFACTURED HOUSING INDUSTRY IN CANADA TO PROVIDE AFFORDABLE HOUSING EFFECTIVELY

In Canada, mobile homes are usually built to the CAN/CSA-Z240 MH standard (Z240) rather than to the provincial code, although some provinces require mobile homes to be built to the provincial building code. The National Building Code (NBC) forms the basis for regulating all site-built housing.

In the United States, the mobile home industry operates under the federal Housing and Urban Development (HUD) Code--a performance-based code which appears to produce mobile homes with similar performance characteristics to Canadian manufactured mobile homes. MHI Canada suggested that there may be situations where the NBC and its provincial equivalents or the Z240 standard have more stringent requirements than are required for occupant health and safety. MHI Canada also believes that there may be other approaches to manufactured housing that will deliver equivalent housing performance, but at a reduced cost. MHI Canada suggested that an examination of the Canadian and U.S. manufactured home industries (with a focus on mobile homes) experience might identify instances where the standards/codes/ materials/procedures, etc. could be modified to improve housing affordability in Canada.

Because of the above scenario, Canada Mortgage and Housing Corporation (CMHC) designed and approved a project to investigate the situation. MHI Canada, the Canadian Manufactured Housing Institute (CMHI), the National Research Council (NRC), Industry Canada and building officials from Alberta, Ontario and Quebec were involved in the advisory committee for the project.

The project began in late 1997 with visits to 11 different Canadian plants (from British Columbia to the Maritime provinces) and one U.S. plant. People familiar with the U.S. market were interviewed. A number of appropriate reports were reviewed during the project. Two project preliminary reports (collections of working papers) were prepared and submitted to the advisory committee. In June 1998, the second preliminary report served as a basis for three round table sessions with the CSA, manufacturers and other parties with a specific interest in the subject matter.

This report is the official record of the project. The report analyzes relative market penetration of manufactured homes between the U.S and Canada and explores the issues which currently impede Canadian market success. Issues explored include construction cost details and general affordability, regulatory frameworks and barriers, distribution systems and regional differences. The report provides a two year plan of action to rebuild the Manufactured Housing Industry especially in relation to the revitalization of its construction standards.

Prepared by L. J. O'Riley & Associates Inc. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Doug Pollard. Ottawa: CMHC, 1999. (Housing Affordability and Finance Series Research Report) 42 pages.

Order number: PE0338

NOTE : Aussi disponible en français sous le titre : Revitalisation de l'industrie des maisons usinées au Canada pour la fourniture efficace de logements abordables

AVAILABILITY : CMHC Information Products

MOISTURE AND MOLD

DETERMINATION OF WATER VAPOUR DIFFUSION ACROSS BRICK MASONRY TREATED WITH WATER REPELLENT SEALERS

The ability for water repellents to allow for water vapour diffusion across treated masonry is an important criteria in the selection of a water repellent. Unfortunately, there appears to be a lack of a standard test procedure to determine the rate of water vapour diffusion across composite materials such as brick masonry assemblies. Wet cup and dry cup methods are often used in the industry to determine vapour diffusion rates, however, these procedures were designed to test uniform sheet materials and are not suitable for composite materials such as brick masonry assemblies.

Consequently, a unique experimental test method was developed for the purpose of evaluating the water diffusion characteristics of six brick masonry panels of which five were treated with a water repellent product. The sixth panel was left untreated to serve as the control sample. The results have indicated that the application of five commercially available water repellent products, specifically designed for use on masonry, had no significant impact on the vapour diffusion characteristics of a masonry wall assembly, in comparison to the control sample.

With regards to long term performance, the panel assemblies were moved to an exterior location for weathering at the completion of initial tests. Following exposure to the elements for a period of approximately one year, the panels will be returned to the laboratory for retesting. The findings of these experiments will be the subject of a future report.

Water vapour transmission or "breathability" and resistance to water penetration performance are both important criteria in the selection of a water repellent for a masonry substrate. The issue of water repellency was the focus of an earlier CMHC study summarized by the report entitled "Performance Evaluation of Water Repellents for Above Grade Masonry"; dated May 15, 1997.

Prepared by Antonio Renzullo, Mario Gonçalves and Armand Patenaude. Prepared for Research Division, Canada Mortgage and Housing Corporation. CMHC Project Officer: Jacques Rousseau.
Ottawa: CMHC, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

PERFORMANCE EVALUATION OF WATER REPELLENTS FOR ABOVE GRADE MASONRY

Water penetration across brick masonry exterior walls is a problem which building owners and construction professionals must deal with frequently. Water repellents are often used in an attempt to resolve water penetration problems in certain remedial applications.

The objective of this project was to evaluate the performance of various water repellents for above grade masonry on a comparative basis and develop practical methods to evaluate their effectiveness. This evaluation was based on lab analysis and field testing as well as a literature review to find available information on water repellent performance.

The results of the study have indicated reductions in water penetration in the order of 34% to 99% upon application of commercially available masonry coatings. The data accumulated during this study also revealed a trend indicating an increase in the rate of water penetration from the time of product application (i.e.; reduced repellency), necessitating product reapplication after a given time interval.

Prepared by Domenic Chiovitti, Mario Gonçalves, Antonio Renzullo. CMHC Project Officer: Jacques Rousseau. Ottawa: Canada Mortgage and Housing Corporation, 1997 (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

WALL MOISTURE PROBLEMS IN ALBERTA DWELLINGS

In partnership with the Alberta Housing Industry Technical Committee, this project investigated the problem of moisture ingress into low-rise wood frame housing in Alberta. A total of 50 buildings were evaluated for potential causes of moisture leakage problems. Some of the buildings in the study were under construction at the time of the investigation. This provided some insight into current building practices without having to open existing building walls. Few of the reported water leakage problems could be attributed to interstitial condensation, but the majority of cases were due to water infiltration from the exterior during wet weather conditions. The report from this project proposes various changes to current building practices to resolve these problems.

Prepared by Building Envelope Engineering Inc., Anton J. Vlooswyk, John A. Vlooswyk, James B. Posey. Prepared by Canada Mortgage and Housing Corporation and Alberta Housing Industry Technical Committee. CMHC Project Officer: Ken Ruest. Ottawa: CMHC, 1999.

AVAILABILITY : Canadian Housing Information Centre

INVESTIGATION INTO THE CAUSES OF RISING MORTGAGE DEBT AND IMPLICATIONS ON THE MORTGAGE MARKET

This study looks at the rising level of mortgage debt in Canada and its implications. The Bank of Canada has noted, with some concern, the rising level of household debt in general and mortgage debt in particular. CMHC has attributed the rise in the latter to mortgages on other than primary residences, and has pointed out that aggregate trends do not take into account the correlation between debts and corresponding assets. By the same token, the National Housing Act (NHA) was changed in 1992 to allow residential mortgages of 95 per cent of the lending value, and first-time owners are allowed to use some of their Registered Retirement Savings Plan (RRSP) funds. These changes should have increased the aggregate demand for mortgage loans. This study extricates the statistical evidence related to growth in mortgage debt and interprets what the trends are indicating.

The study found:

- Despite the rising level of consumer debt, the state of the household balance sheet, on a national accounts basis, is wrong.
- The rising level of consumer debt is principally due to a rising level of mortgage debt, almost exclusively loans by the chartered banks. However, included in the mortgage debt numbers is an unknown quantity, which represents rental properties, cottages, nursing homes, retirement communities and other non-primary residences. A conservative estimate of these portions, taken together, would be approximately one third, in line with the tenure breakdown of the housing stock.
- Despite the use of an estimate of household mortgage indebtedness inflated by mortgages on properties other than principal residences, the mortgage loans outstanding remain well secured by the housing wealth of the country, which continues to rise, albeit at a more modest pace that in previous decades.
- At the household level, using data from the FAMEX from 1982 to 1992, there is no evidence that households have become appreciably more mortgage-indebted over that period. The 1996 survey, when it becomes available, will show the effect of the program-driven, high-ratio mortgages on the overall picture.
- According to industry sources interviewed for this study, credit, is to some extent, supply-enabled, in the sense that the availability of credit and its terms and conditions help shape the debt load assumed by individuals and households.
- There is no evidence of a direct link between high aggregate mortgage debt and the rising level of bankruptcy. Homebuyers who go bankrupt are most likely to be first-time buyers with unresolved debt management issues.

- Finally some portion of the growth in aggregate debt could be expected given the underlying demographics - the baby boom generation has been moving through its peak borrowing years. At this group moves into its saving period, a smaller group will replace it. At the same time, the baby boom generation also stands to inherit a substantial amount of wealth from its prewar parents' generation. The conjuncture of these elements should mean that the high consumer debt will start to decrease.

Prepared by the Corporate Research Group Ltd. in association with Fuller Information and Jacobson Consulting Limited. Ottawa: Canada Mortgage and Housing Corporation, 1999.

AVAILABILITY : Canadian Housing Information Centre

MORTGAGES AND HOUSING FINANCE

PERSPECTIVES À LONG TERME DE LA DEMANDE DE PRÊTS HYPOTHÉCAIRES AU CANADA

Due to weaker demographic growth, the need for new homes is declining, which is having a moderating impact on housing starts. In addition, the Canadian population is aging and will likely not have to borrow as much to buy a home. The objective of this study is to estimate the effect of these trends on the Canadian residential mortgage market.

This econometric study reviews and extends the economic theory which is aimed at explaining the demand for mortgages, and the related empirical work. It then examines a variety of scenarios for the period to 2026. The study found that the value of new mortgage loans is highly correlated with that of housing, but is also affected by the level of interest rates. The number of new mortgage loans is affected by the level of interest rates and the number of persons in the 25 to 34 age group. The total value of outstanding mortgage debt over time is affected most by the progression of incomes.

The projections suggest that while the average value of new mortgage loans will increase, the total value of outstanding mortgage debt in real terms (i.e. adjusted to remove the effects of inflation) and the number of new mortgage loans may fall, particularly over the period from 2003 to 2026. The extent of the decrease will depend on the path of economic growth and the size of the 25 to 34 age group.

Prepared by Mario Fortin and André Leclerc. CMHC Project Officer: Ian Melzer. Ottawa: Canada Mortgage and Housing Corporation, 2000.

AVAILABILITY : Canadian Housing Information Centre

PERSONS WITH DISABILITIES

ACCESSIBLE DOWNTOWN RESIDENTIAL COMMUNITIES: A CASE STUDY OF WINNIPEG, MANITOBA

The purpose of this project is to identify housing and community design needs of persons with mobility, dexterity and sensory disabilities to determine how these needs can be met in a downtown residential location as part of the revitalization of the downtown area. Incorporating diverse physical needs in the design of the built environment will help to ensure that the resulting product is usable by all members of the community. Using interviews and focus group meetings, Downtown Winnipeg and other downtown areas are examined as accessible residential sites for persons with disabilities and seniors.

The research reviews design considerations and priorities in making housing and communities accessible and usable by persons with disabilities, which will benefit everyone regardless of age, ability or size. Numerous strategic actions are proposed for downtown stakeholders to improve accessibility in residential developments and neighbourhoods within Downtown Winnipeg as part of a comprehensive downtown accessibility strategy. These actions are designed to contribute to greater livability and usability to the downtown area, which will have an important impact on the success of downtown revitalization initiatives in Winnipeg as well as other cities.

Prepared by Nancy Klos, Don Ament, Brian Everton with Ragini Dayal. CMHC Project Officer: Tom Parker. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

PERSONS WITH DISABILITIES

EXAMINATION OF THE SUPPORTIVE HOUSING NEEDS OF THE SERIOUSLY MENTALLY ILL IN THE MANITOULIN-SUDBURY DISTRICTS

This External Research study aimed to explore and specify the supportive housing needs, preferences and choices of adults with serious mental illnesses, and in particular to identify similarities and differences among subgroups of this "SMI" population along the lines of geographic location, language/culture, and gender. The study was undertaken in the Manitoulin-Sudbury area of Ontario, where community locales range from urban to rural and remote, and significant proportions of the population are anglophone, francophone and Aboriginal, respectively. One hundred mental health services consumers were interviewed from across the region, plus a cross-section of mental health services providers and representatives of consumer/family support groups. Results indicated that there is a need for supportive housing among all SMI population subgroups regardless of geography, language/culture or gender. The most notable difference among the subgroups was related to geography: consumers living in rural communities outside of the Sudbury district have a higher need for supportive housing because of increased isolation and lack of access to public transportation. Variations by language/culture and gender are also noted in the report although they were not found to be statistically significant in this sample. The report concludes with a series of recommendations to address the identified supportive housing needs.

Prepared by Geneviève Gibbons, David Paquette. CMHC Project Officer: Teresa van den Boogaard. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

PROPERTY MANAGEMENT

CANADIAN RESIDENTIAL PROPERTY MANAGEMENT INDUSTRY PROFILE

The objective of this project was to produce a profile of the residential property management industry containing statistical and descriptive information concerning the size and concentration of the industry, and the roles and responsibilities of key players. It found that the residential property management industry is concentrated in Ontario, followed by Quebec and British Columbia. At the national level, in 1996, the Canadian residential property management industry comprised 13,689 establishments with: revenues of $8.5 billion; profits of $560 million; and employees earning $1.3 billion in salaries and employee benefits. These findings and others are provided at the provincial level as well. This is the only consolidated source of information on the Canadian residential property management industry. It contains previously unavailable statistical information on the economic characteristics of the industry.

Prepared by Mike Ross, Jason Ducharme, Robert Sweeting, Didem Tiryakioglu, of KPMG LLP. Ottawa: Canada Mortgage and Housing Corporation, 1999. (Housing Affordability and Finance Series Research Report)

Order number: PE0364

NOTE : Aussi disponible en français sous le titre : Profil de l'industrie canadienne de la gestion immobilière résidentielle.

AVAILABILITY : CMHC Information Products

MULTI-UNIT RESIDENTIAL BUILDING MANAGEMENT AND THE ISO 14001 STANDARD FOR ENVIRONMENTAL MANAGEMENT SYSTEMS

The report highlights how the international standard for environmental management systems may be applied to the residential property management industry. The report examines both current residential building management practices and the ISO 14001 standard, in effort to find out whether the standard is of value to the industry and presents a preliminary investigation of how it could be implemented.

The report provides background information on various building management scenarios, and key players in the industry. It includes both non-profit and for-profit multi-unit residential buildings, including housing co-operatives and condominiums. Currently available building management resources, including books and computer software, are listed in the report, along with related associations. The report also provides a brief examination of legislation and regulations related to residential property management and the environment.

In order to acquaint the reader with ISO 14001, the report briefly documents the history of the standard, along with a brief description of its major principles and elements. The benefits of the standard are presented, along with a look at its overall level of acceptance, in both Canada and on the international scene.

The main research method for the CMHC report included a survey conducted through a series of interviews with people directly involved in managing residential apartment buildings, condominium complexes, offices and commercial properties. Other people interviewed include government employees, ISO 14000 experts, product and services suppliers, health and environment experts, and property management association members. The report includes a discussion of the survey results, which also appear in the appendices in tabular form. Additional information in the report was gathered from a variety of printed and electronic sources, and from members of an advisory board made up from industry representatives.

Recommendations made by the report include the education of the industry through conferences, workshops and association newsletters and government incentives to encourage participation. The report also makes various recommendations for implementation of the standard, and proposes the use of focus groups and pilot projects for further study. A final recommendation is the development of a set of specific guidelines for implementing the standard in residential building management.

This report will be of interest to anyone interested in property management and sustainability. The report provides valuable information for anyone interested in setting up an environmental management system for a multi-unit residential building based on the requirements of the ISO 14001 standard.

Prepared by Vince Catalli, Kathleen Dorner, Environmental Management Institute. CMHC Project Officer: Silvio Plescia. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

RENOVATION AND INSPECTION

HEALTHY HOUSING RENOVATION PLANNER: RENOVATE THE HEALTHY WAY

The "Healthy Housing Renovation Planner" is a step-by-step workbook to planning a healthy renovation.

Chapter One explains the links between your home, your health and the environment. it presents the key principles of Healthy Housing - contributing to occupant health, reducing energy consumption, conserving natural resources, minimizing environmental effects and balancing cost and practicality.

Chapter Two discusses the health effects of indoor air quality, with special attention to environmental hypersensitivities. A Home Health Checklist guides you through your home to help you identify sources of air quality problems - and solutions to them.

Chapter Three discusses the importance of up-front planning, walking you through the things you should think about before you begin your project. It describes the "house as a system", how you can renovate according to Healthy Housing principles and how you can get the most for your renovation dollar. Chapter Three will help you determine whether you have the skills and the time to do the job yourself. If you decide to hire a professional, Chapter Three gives you the information you need to choose the renovator who is best for you. The Chapter also discusses the critical importance of a written contract, insurance, building codes and by-laws and ways to minimize inconvenience while a project is under way.

The rest of the Renovation Planner deals with typical renovations, both large and small. In each chapter, you'll find several steps to help you plan a healthy and affordable project. Each chapter focuses on key issues involved in the renovation project: taking stock of the part of the house to renovate, evaluating options and strategies for making changes, and making a plan.

There are charts and checklists throughout the Renovation Planner so you can record your observations and your choices . Project planning worksheets help you assemble all the parts of the puzzle in one place. Lists of publications provide you with additional information on the subjects discussed.

Ottawa: Canada Mortgage and Housing Corporation, 1999. 320 pages.

Order number: NE2172 **Price: $34.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Rénovation de la maison saine.

AVAILABILITY : CMHC Information Products

HOMEOWNERS INSPECTION CHECKLIST

The current CMHC's Homeowner's and Homebuyer's: Inspection Checklist for Maintenance and Repair was updated and completely revised and now includes a Healthy Housing evaluation "tool". It provides homeowners and homebuyers with a pre-purchase or pre-renovation guide for performing an inspection on their house. Physical condition, IAQ, energy and environmental and maintenance and repair information is included in the document. It will enable consumers to make more informed decisions prior to hiring the assistance of a private home inspector should the need arise.

Prepared by Ted Kesik. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Darrel R. Smith. Ottawa: CMHC, 2000. 107 pages.

Order number: 2444E ** Price: $19.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Guide d'inspection pour le propriétaire-occupant

AVAILABILITY : CMHC Information Products

HOMEOWNER MOTIVATION AND REVITALIZATION OF OLDER RESIDENTIAL NEIGHBOURHOODS: A STUDY OF INCUMBENT UPGRADING IN WINNIPEG: FINAL REPORT

Recent research in several cities has identified significant upgrading and renovation of homes by residents in stable modest income neighbourhoods. Distinguished from gentrification, which is associated with renovation of homes following the movement of higher income residents into older neighbourhoods, the upgrading in these stable lower income neighbourhoods is known as incumbent upgrading. Urban policy analysts recognize incumbent upgrading as an important process in preventing decline. This study focuses on three Winnipeg neighbourhoods in which incumbent upgrading is identified as the revitalization process. To improve our understanding of this process, a detailed analysis of the characteristics of these neighbourhoods is undertaken and the factors motivating modest income homeowners to upgrade their home and property are explored.

The work suggests that while public investment in improved infrastructure and community services is a motivating factor to spend money on improvements, other factors such as attachment to neighbourhood, perception of crime rates, neighbourhood cohesiveness, participation in neighbourhood organizations and a positive perception of neighbourhood in general may be more important. It follows that fostering this positive perception of neighbourhood may encourage upgrading in modest and lower income neighbourhoods and help prevent decline. The findings suggest that policies which help prevent or address existing systemic problems such as poverty and its numerous associated problems may be more important in fostering this positive perception than public initiatives to improve physical infrastructure.

Prepared by Tom Carter and Christian Douchant (principal investigators). Research assistants: John Hoehn and Maggie Fredrickson. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

RENOVATING DISTINCTIVE HOMES: 1-½ STOREY POST-WAR HOMES

Different types of houses pose different renovation challenges and problems. For the 1- 1/2 storey house, the size, the semi-attic bedroom and the construction methods all pose special problems.

This book gives you the information you need to plan and successfully renovate your 1- 1/2 storey house. It includes:

- technical information about the methods used to build your house, so you and your renovation contractor know what to expect;
- information about problems you can expect renovating a 1- 1/2 storey house;
- information about new housing trends, such as Healthy Housing and FlexHousingTM that you can include in your renovation plans to make your house healthier for the people who live in it and adaptable to their future needs.

Chapter 1 tells you about the construction of your 1 1/2 storey Home. Chapter 2 is about typical problems in older homes -- problems that need attention. Chapter 3 is an overview of renovation and will help you plan your renovation project. Chapter 4 gives you even more planning help, with worksheets, checklists and a sample renovation contract. Chapter 5 and Chapter 6 have renovation ideas that have worked and construction tips to help you and your contractor. Finally, Chapter 7 tells you where you can find more information about every aspect of renovation.

Prepared by Canada Mortgage and Housing Corporation. Ottawa: CMHC, c2000. iv, 88 pages

Order number: NHA2344 **Price: $14.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : La Maison réinventée : Renovation d'une maison d'après-guerre d'un étage et demi, LNH2344

AVAILABILITY : CMHC Information Products

RENOVATORS AND THE INTERNET: INTERNET USAGE BY RESIDENTIAL RENOVATORS IN CANADA, 1998-2001

The objective of this research was to learn more about how residential renovators use the Internet and to identify the types of information and services on the Internet which would be useful by renovators. Also, the research was to identify the main reasons why renovators are not using the technology.

The findings of the project were that the housing renovation industry in Canada is not using the Internet to its full potential as a business tool. Only a small minority of renovators use the Internet at all and those who do use it only minimally and with very limited effectiveness. The most popular Internet feature used by renovators is e-mail There is a considerable amount of very valuable information available to renovators on the Internet on such topics as construction technology, building products and equipment, weather conditions, business information, etc. The main reason stated by renovators for not using the Internet was that they didn't think they needed it. Encouragement and guidance by industry associations, training/educational facilities, government organizations and on-line renovation magazines will be needed to improve the use of the Internet by renovators, particularly the design and promotion of industry web sites and on-line search techniques.

Prepared by Donald M. Caskie. CMHC Project Officer: Darrel Smith. Ottawa: Canada Mortgage and Housing Corporation, 2000. 143 pages

AVAILABILITY : On a loan basis only from:
Canadian Housing Information Centre

RENTAL REPAIR AND RENOVATION IN CANADA

This report presents analysis and data highlights from the Rental Repair and Renovation Expenditure Survey (RRRES). Statistics Canada conducted the RRRES on behalf of Canada Mortgage and Housing Corporation (CMHC). Clayton Research Associates Limited analyzed the information for presentation in this report.

Since 1988, through the Homeowner Repair and Renovation Expenditure Survey (HRRES), Statistics Canada has provided annual information on repair and renovation work undertaken by homeowners. However, no comparable information was available for rental units. The main objective of the RRRES, therefore, was to fill this information gap by collecting information on the expenditures made by landlords on repairs and renovations to rental units. The survey covered only private rental units; public housing units were excluded. As well, the survey excludes spending by tenants on rental units.

Respondents were asked to report repair and renovation expenditures (both costs of materials, and contracted work) for the following types of work: additions, renovations and alterations; replacement of equipment; new installations; repairs and maintenance. The RRRES also collected information on housekeeping costs.

In addition to an introduction, the report contains two main sections:
- "Highlights" summarizes key survey results from the RRRES.
- "Comparison to Homeowner Repair and Renovation Spending" compares the estimates of spending on private rental units with estimates for the ownership units from the HRRES.

In addition to the main report, the report contains three appendices:

- Appendix A reproduces the Labour Force Survey Contact Information Form, which was used to screen participants, and the Rental Repair and Renovation Expenditure Survey questionnaire.
- Appendix B discusses the survey methodology in more detail.
- Appendix C presents detailed tabulations for figures in the main report. These include data on the incidence of repair and renovation spending and the average spending per unit by type of work, region, structural type of building and period of construction.

Prepared by: Clayton Research Associates Limited. Project Manager: Patricia Arsenault. Prepared for: Canada Mortgage and Housing Corporation. CMHC Project Manager: Roger Lewis. Ottawa: CMHC, 1998. (Housing Affordability and Finance Series Research Report)

Order number: PE0316

NOTE : Aussi disponible en français sous le titre : Réparation et rénovation de logements en location au Canada

AVAILABILITY : CMHC Information Products

CHANGING RURAL RENTAL MARKET IN ATLANTIC CANADA

This report describes how the rural rental market in Atlantic Canada has changed from the early 1990s to today. The term "rural" is used to include all incorporated communities of less than 10,000 in population, plus all incorporated areas, as defined by Statistics Canada. The study assessed the impact of the changing rural economy, the termination of new social housing construction, the decline in mortgage interest rates, and the implementation of the 5% down payment program for home buyers. This study also developed an understanding of the climate for investment in rental properties, identified opportunities for communities and government to support new rental housing construction, and developed an understanding of the risks associated with multiple unit development in rural areas and small towns.

Prepared by David Bruce. CMHC Project Officer: Carolyn Kavanagh, Atlantic Business Centre. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

FEASIBILITY STUDY FOR A MULTI-UNIT RENTAL HOUSING DATABASE

This study reviews the feasibility of a data base on multi-family rental housing that would allow investors, developers and builders to obtain current market information on the operating costs and rates of return from alternative buildings. Specifically it examines the demand and potential use for this information, the willingness to pay to access the data, and most importantly, the willingness of industry participants to share information on their property. Clearly, central to such a data base are the procedures used to aggregate information to protect the confidentiality of individual properties. Based on extensive interviews, the study concludes that insufficient interest exists in the housing industry at this time to support this concept. Although respondents reported that they need information on individual urban multifamily markets, most think that costs for such a database would be prohibitive. They also believe that even in large centres, insufficient numbers of properties exist to support useful information once they are aggregated into clusters to protect identities; also, market information from one city is of little use in another. Finally, respondents stated that other issues need to be resolved (e.g. renewing the deteriorated stock) before a database is developed for the multifamily housing market. The results of this research report will be of interest to builders, housing analysts and rental housing investors.

Prepared by PRA Inc. CMHC Project Officer: David Scherlowski. Ottawa: Canada Mortgage and Housing Corporation, c2000. (Housing Affordability and Finance Series Research Report)

Order number: PE0377

Aussi disponible en français sous le titre : Étude de faisabilité d'une base de données sur le logement locatif multifamilial

AVAILABILITY : CMHC Information Products

PRIVATE RENTAL POLICIES AND PROGRAMS: REVIEW OF THE INTERNATIONAL EXPERIENCE

This report examines the experience of 11 countries (including Canada) from Europe, Scandinavia, North America and the Pacific Rim in supporting a private rental sector as part of their national housing system. The purpose was to examine the extent to which other governments have developed policies and programs specifically to encourage the production of rehabilitation of the private rental stock.

The main body of the report reviews the objectives of the research, develops a framework for the comparative assessment and looks at the rental market in the selected countries. It then outlines policy issues specific to the private rental sector since 1980 and how each country has responded, summarizing the major policy and program initiatives, which have been identified for each country, and assessing the relevance of this experience for Canada.

An appendix provides a detailed profile of each country. It presents the general background on the relative importance of the private rental stock in each country's housing system, the regulatory and tax regimes that affect private rental housing, and the current policy issues related to the private rental sector. Detailed assessments of specific major policies and programs in each country are also included.

Key findings of the report include:

1. In almost all countries, except in instances of pressing urgency, governments have adopted a "laissez-faire let the market forces prevail" approach with regard to encouraging and facilitating private rental housing.
2. Across all countries, the fundamental cause of the low level of investment in private rental production and rehabilitation is the lack of a competitive return relative to other forms of investment, especially in light of the risks inherent in rental investment.
3. The only countries that appear to have maintained a healthy investment for private rental housing without direct subsidies are New Zealand and Australia. Notably, neither have rent controls and permit depreciation and deductibility of rental losses against other sources of income.
4. Variants of virtually all the policy and program initiatives used in other countries have been attempted in Canada over the last three decades.
5. The most critical rental issue facing most governments is not simply the lack of private rental housing production, but the problem that many low-income households do not have sufficient incomes to access rental housing at a cost they can afford.

Prepared by Steve Pomeroy, Focus Consulting in association with Greg Lampert and Kathleen Mancer. Ottawa: Canada Mortgage and Housing Corporation, 1998, c1999. (Housing Affordability and Finance Series Research Report) 100 pages

Order number: PE0337

NOTE : Aussi disponible en français sous le titre : Politiques et programmes relatifs au secteur locatif privé : étude sur l'expérience internationale

AVAILABILITY : Canadian Housing Information Centre

UNDERSTANDING PRIVATE RENTAL HOUSING INVESTMENT IN CANADA

The key study objectives were:
- To examine the nature and extent of private rental housing investment in Canada;
- To develop a profile of who is investing in private rental housing; and
- To establish a thorough understanding of what investors and lenders consider in their decision-making process.

The ultimate goal of the research was to provide a solid basis from which public and private sector decision-makers can act in an informed manner.

Rental housing can be divided into two broad sectors:
- Private rental housing refers to units owned by private sector investors; the owner or occupants may have received a government subsidy/incentive at some point, but the units themselves remain in the hands of the private sector.
- Social/assisted rental housing includes any publicly owned rental building, including non-profit and co-op buildings.

It is private rental housing which forms the focus of the current study.

Investment in private rental housing can take a variety of forms, including:

- Developing new "purpose-built" rental properties for own portfolio or for sale to other investors;
- Purchasing rental properties from a previous investor (or developer);
- Holding/owning existing rental properties on an on-going, longer-term basis;
- Converting purpose-built owner-occupied or non-residential space to rental tenure - either temporarily or permanently; and
- Upgrading existing rental properties (i.e. renovation/repair work).

This report covers each of these various types of private rental investment to some degree. However, the emphasis of the analysis, particularly with respect to the development of a profile of rental investors, is on what are termed "active" investors - those who invest in new units, or are purchasing existing units.

The study takes a Canada-wide view of private rental investment. Where available, statistical information is presented for the 26 Census Metropolitan Areas (CMAs). In addition, the following 6 major markets have been selected for more in-depth analysis in some instances: Halifax; Montreal; Toronto; Winnipeg; Calgary; Vancouver. These centres were chosen as they are among the largest rental markets, and also provide for a degree of geographic variation.

Prepared by Clayton Research Associates Limited and Fish Marks Jenkins Real Estate Consulting. Ottawa: Canada Mortgage and Housing Corporation, c1999. (Housing Affordability and Finance Series Research Report)

Order number: PE0335

NOTE : Aussi disponible en français sous le titre : Comprendre les activités d'investissement dans le logement locatif privé au Canada

AVAILABILITY : CMHC Information Products

DENSIFICATION RÉSIDENTIELLE EN QUARTIER CENTRAL : LE CAS DU MILE-END À MONTRÉAL

Residential intensification is a subject of great interest, as there is a will to slow down urban sprawl, to revitalize central city districts and to optimize the use of existing infrastructure. This research project examines the intensification phenomenon that has recently occurred in the Mile-End district near downtown Montréal where close to 1,000 new dwellings have been added to the existing housing stock over five years. Fifty cases of new construction, existing building recycling and demolition-reconstruction projects were enumerated within an area covering just 226 hectares. A survey among the residents of the new dwellings provided more information about these central district clients and their motivations, as well as the features of the new dwellings. Are the residents new in the sector? Are the new dwellings affordable and for whom? What factors encourage or, on the contrary, discourage residential intensification? This research project attempts to provide answers that could be useful to Canadian municipalities contending with declining sectors and wishing to develop effective revitalization policies.

Prepared by Jocelyn Duff and Terrence Dawe. CMHC Project Officer: Mark Holzman. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre .

ECONOMIC IMPACTS OF ANCILLARY HOUSING EXPENDITURES (VOLUME 1: SUMMARY REPORT; VOLUME 2: TECHNICAL REPORT)

This study develops up-to-date estimates of the economic impacts of a variety of housing-related ancillary expenditures. It is intended to complement an earlier series of studies commissioned by CMHC in 1997/1998 that estimated the economic impacts of basic housing construction and renovation. In the present case, economic impacts are obtained for ancillary expenditures (rather than direct construction) from three related types of housing expenditure: initial construction preparation (hereafter, 'new construction'), the sales of newly-constructed dwelling units held in stock, and the sales of existing dwellings. A variety of ancillary expenditures are considered, including, where possible, infrastructure and land development, selling costs, professional fees and financing. The contractor provides estimates of direct, indirect and induced impacts on aggregate and sectoral employment and GDP from ancillary expenditures associated with residential construction expenditures, sales of newly-constructed dwellings and sales of existing dwellings.

Prepared by Peter Dungan and Peter Norman. CMHC Project Officer: David Metzak. Ottawa: Canada Mortgage and Housing Corporation, 2000. 2 volumes

AVAILABILITY : Canadian Housing Information Centre

EFFECTS OF DEVELOPMENT CHARGES ON URBAN FORM: AN ECONOMETRIC ANALYSIS

This report examines the connections between increasing development charges placed on residential construction and the spread and density of cities. It first reviews the literature on the extent to which increases in development charges increase housing prices and on the estimated coefficients describing the price elasticity of demand for housing.

The empirical work develops multivariate logit models of tenure and building type choice by examining the differences across Canadian cities attributable to differences in the price of housing services relative to consumers' income.

The study concludes that increasing development charges favours the growth of demand for higher-density building types, primarily by keeping a relatively large proportion of households out of the homeownership market. Both homeowners and renters are shown to react to higher price levels by increasing their propensity to move into a row or townhouse rather than a single-family detached house, or to move into an apartment rather than a townhouse. Young people are affected more than older people by increases in development charges.

The report will benefit planners, municipal finance officers and elected officials interested in market-based tools and techniques to influence urban growth and development.

Prepared by Andrejs Skaburskis. CMHC Project Officer: David D'Amour. Ottawa: Canada Mortgage and Housing Corporation, c1999. (Healthy Housing and Communities Series)

Order number: PE0351

NOTE : Aussi disponible en français sous le titre : L'effet des droits d'aménagement sur la forme urbaine.

AVAILABILITY : CMHC Information Products

IMPACT OF SECONDARY SUITES ON MUNICIPAL INFRASTRUCTURE AND SERVICES

The purpose of this research was to investigate and summarize different approaches for determining the municipal servicing costs, both capital and operating, of secondary suites in established neighbourhoods and new subdivisions, through a literature review, resident surveys and key municipal government informant interviews.

Municipalities are increasingly relying on user fees as a way to generate revenue. In BC, there is a growing trend to apply this approach to secondary suites, and municipalities are introducing utility fees and other charges for municipal services for both legal and illegal suites. This is in response to a perception that suites place an additional burden on municipal infrastructure. The rationale provided for these fees is to provide revenue to address the impact of secondary suites on municipal infrastructure and services, and to address community concerns that suites should pay their "fair share" of municipal taxes and costs. However, there is concern about how charges are being calculated and whether they are being assessed equitably. There are also claims that the charges are motivated by municipalities' need to seek additional revenues other than property tax.

This report examines the impact of secondary suites on municipal infrastructure and services. It also assesses the validity of different approaches regarding charges for secondary suites based on a literature review and case studies of three municipalities.

The literature review found no empirical evidence of actual impacts of secondary suites that would justify charging fees. The most commonly held view is that accessory apartments should not place an increased burden on services because they are most likely to occur in areas that have experienced a decline in population and reduced household sizes.

The case studies showed that the impact of secondary suites is likely to vary considerably based on the type of municipality. In urban core municipalities, a minimal impact is likely. Newly developing greenfield outer suburbs may face the greatest impact. In inner suburbs, the impact is unknown. Survey results demonstrated that homes with suites do not consume twice the mount of municipal services as those without. For virtually all aspects of urban infrastructure examined: water and sewer, garbage and recycling, and parking - the occupants of homes with secondary suites consumed less than double the services. Therefore, if municipalities wish to charge for these services on a per unit basis, according to this study, it would appear that the rate for secondary suites should be less than the charge for single family homes.

The authors found that municipalities first need to determine if they wish to charge for suites. The authors recommend that municipalities consider affordable housing policy objectives, administrative issues, and demographic trends in their area. If they wish to charge, they should consider charging based on consumption or based on the type of municipality. The study found the impact of secondary suites on municipal infrastructure to vary in urban core and outer suburban municipalities.

Prepared by Vanessa Geary, Tenant's Right Coalition, Margaret Eberle, and Deborah Kraus. CMHC Project Officer: Steve Mennill. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

INFORMATION REVOLUTION AND RESIDENTIAL DEVELOPMENT: SUMMARY REPORT

The purpose of this report is to provide a broad overview of the implications of the information revolution for residential development. It identifies the key drivers of change related to the information revolution that impact residential development and describes the state-of-the-art in information and communications technologies in community planning.

Prepared by Pamela Blais, Metropole Consultants. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

NOTE : Aussi disponible en français sous le titre : La Révolution de l'information et l'aménagement résidentiel

AVAILABILITY : Canadian Housing Information Centre

INNOVATION IN PRACTICE: KEYS TO ALTERNATIVE DEVELOPMENT STANDARDS

This study aimed to find ways to accelerate innovation in residential land use. Due to the widening gap between subdivision standards and demographically-driven housing needs, the obstacles to challenging established rules and regulations (fighting city hall), and the fact that few initiatives have made significant headway into modifying standards, this research sought keys to how innovative standards get introduced. The primary objective was to isolate critical factors enabling alternative development standards (ADS) according to developers who have succeeded in introducing ADS, as well as municipal officials involved in these projects. As a secondary objective, interviewees were asked for ideas on how to address complex regional scale (off-site) standards, such as those affecting stormwater, arterial road, school and park infrastructure.

Interviews produced practical advice and strategies on how to successfully alter standards, which should assist future ADS proposals. Even more important, close inspection of this information revealed keys to successful initiatives, namely that proponents instinctively nurtured four critical conditions: (1) clear rationale for and presentation of proposals, (2) municipal receptivity, (3) ability to support an extended approval process, and (4) readiness of the housing market for alternative housing and community forms. Notably, proponents cultivated these key conditions rather than regard their absence as barriers to innovation.

Concrete suggestions for how to change off-site standards were elusive; however a clear picture of deterrents to evolution of these standards emerged. Major deterrents include adherence to "Cadillac" standards, lack of leadership, and most importantly, lack of information and communication, especially the availability of concise and relevant information and effective information exchange. Better information alone, particularly concerning who really pays for the full costs of expensive off-site infrastructure, would be productive.

Developers, municipalities and higher-order levels of government each can uniquely contribute to the move towards more affordable, community-minded, and environmentally sustainable land use standards. Recommendations are provided for each group that can, if implemented, accelerate the adoption of innovative standards so that they can better keep pace with changing housing needs.

Prepared by Teresa Paul, Habitat Associates with the assistance of Chris Hartman, Bryan Kozman and Andy Manahan. CMHC Project Officer: Doug Pollard. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

INTENSIFICATION IN URBAN AREAS

This report examines the issue of urban intensification in order to deal with population growth pressures and sprawl. Intensification (also referred to as revitalization or re-urbanization) is a counter-sprawl concept intended to slow the trend toward rampant development of greenfield sites on the urban fringe. Recent studies have found that an intensified development form could result in at least 25% reduction in infrastructure costs and a 40% savings in land consumption. Canadian cities need to encourage mixed-use intensification -- including both new jobs and new housing -- in order to assure efficient public transit, to accommodate changing populations, and to ensure sufficient jobs and population to maintain vibrant urban centres.

Computer visualization is employed in this study to project (in "picture" form) the size, shape, location and appearance of proposed developments and their associated density implications. This technology, which combines geographic information systems and computer-aided design software, is used to illustrate the impacts of intensification on neighbourhoods and the potential visual effects of projects that have not yet been built.

This report demonstrates that:

- Residential and mixed-use intensification is already occurring in some Canadian cities;
- Infill and intensification may be (and have been) effectively employed to increase the stock of affordable housing and to revitalize urban centres; and
- Governments and housing providers must re-think the basis for regulatory controls, rigid building and zoning codes, as well as planning mechanisms which impede the production of low-cost housing;
- Intensification has been achieved by a variety of measures; these include design guidelines in lieu of outdated zoning controls, as-of-right zoning to reduce time delays and processing costs, live/work spaces to promote the provision of both residences and jobs in the city, and the use of density bonuses to encourage concentrated development in key locations (such as transit nodes on major arterials) where revitalization is desirable.

Prepared by Gerald Daly, Richard Milgrom. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 1998. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

INTERNATIONAL EXPERIENCES WITH PERFORMANCE-BASED PLANNING

This study examined international approaches to planning and development regulation through the use of performance based planning. These approaches provide useful lessons and insights in improving the flexibility and effectiveness of the development environment in Canada. In addition to summarizing existing literature on the topic, the research includes the results of interviews with government, development and academic informants in Australia, New Zealand, the United States and Europe.

Prepared by Hok-Lin Leung and Kevin A. Harper for Research Division, Canada Mortgage and Housing Corporation. Ottawa: CMHC, c2000. (Housing Affordability and Finance Series; Research Report)

Order number: PE0378

NOTE : Aussi disponible en français sous le titre : La planification fondée sur le rendement : étude de cas à l'étranger

AVAILABILITY : CMHC Information Products

RESIDENTIAL DEVELOPMENT

LEARNING FROM SUBURBIA: RESIDENTIAL STREET PATTERN DESIGN

This investigation of suburban street patterns was prompted by the current debate on the state of suburban development, including its forms and the impact of street patterns on the quality of life in suburbs.

Street patterns contribute significantly to the quality and character of a community. When placed in their proper historic context, street patterns become meaningful by revealing their functions, and may then help address contemporary planning issues. the study identifies some of these issues, examines the evolution of suburban street patterns and, by synthesizing those attributes of street patterns that best respond to the contemporary suburban context, suggests the following design strategies:

- rationalize conventional suburban street patterns while maintaining their essential characteristics;
- restructure the private and public realms based on the current technological, economic and social context;
- establish a structured framework of stable and alterable design elements to accommodate physical change; and
- establish regular but diverse cells to manage growth.

Prepared by Julie Tasker-Brown and Sevag Pogharian. CMHC Project Officer: Fanis Grammenos. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

ROOFTOP GARDENS

GREENBACKS FROM GREEN ROOFS: FORGING A NEW INDUSTRY IN CANADA

The purpose of this study is to review the benefits of green roofs and vertical gardens, examine barriers to diffusion of technologies in Canada and recommend ways to overcome those barriers.

Green roof and vertical garden technologies offer an outstanding number of public and private benefits including: energy cost savings from increased insulation; increased property values; savings on stormwater infrastructure; air quality improvements; and enhanced aesthetic, health and recreational opportunities.

Barriers to the diffusion of these technologies include: lack of knowledge and awareness; lack of incentives; cost barriers; technical issues; and risks associated with uncertainty. These barriers can be overcome by: compiling a repository of knowledge on the Internet; high profile demonstration projects; government procurement support; government policy and program support; financial incentives such as insurance premium reductions and performance based contracting; and research to address information gaps.

Prepared by Steven W. Peck, Chris Callaghan, Brad Bass, and Monica E. Kuhn. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

ADJUSTMENT OF THE ELDERLY TO CONGREGATE CARE HOUSING

This study proposed and tested a model to predict which elderly persons will adjust well to which forms of congregate care housing. Congregate care is defined as multi-unit residential housing for seniors who are physically and mentally healthy, but require some non-medical support services. The study's specific goal was to discover some (a) aspects of congregate care housing that promote positive adjustment for virtually all residents, (b) resident characteristics associated with satisfaction regardless of building, and (c) salubrious combinations of building and resident characteristics associated with positive resident adjustment. The ultimate practical goal, for which this study was a first step, was to develop an assessment device that will predict which persons will better adjust to which forms of congregate care housing.

Prepared by Robert Gifford for Optimal Environments, Inc. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

AGING TENANTS IN THE PRIVATE RENTAL MARKET

This report presents the results of a case study analysis undertaken in Vancouver, Victoria, and Winnipeg of privately owned and operated rental buildings occupied by a significant concentration of aging tenants. The focus of the research project was four-fold:

- to conduct a review of the literature focused on aging tenants in the private rental market;
- to assess, via a series of case studies, the willingness and the capability of private landlords in Vancouver, Victoria, and Winnipeg to respond to the needs of their aging tenants;
- to identify and describe initiatives that have been undertaken in the private and public rental sectors across Canada to accommodate the needs of aging tenants;
- and to describe measures that may help landlords address the needs of aging tenants.

Prepared by Kathleen Mancer in association with Donna Kosmuk and Roger Langlais. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

HOUSING FOR OLDER CANADIANS: THE DEFINITIVE GUIDE TO THE OVER-55 MARKET

Canada's older market - 55 and older - is healthier, more active, more informed, more affluent and more demanding than ever before. "Housing for Older Canadians" is the definitive guide for individuals and organizations who want to design, develop, market, manage and sponsor housing for the "over-55" market. Parts of this book will also be useful for support-service providers and for organizations representing older people and who want to help their members find appropriate housing solutions. The guide is tailored to Canadians, and draws on experiences from Canada and other countries, such as the United States.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

Order number: NE2184 **Price: $49.95 + GST and handling charges.

NOTE : Aussi disponible en français sous le titre : Le logement des aînés au Canada.

AVAILABILITY : CMHC Information Products

HOUSING OPTIONS FOR PEOPLE WITH DEMENTIA

One disease that can affect older people is dementia. This is a term used for a group of symptoms that affect mental abilities, including: the ability to remember, reason, make decisions, judge and communicate. There are various forms of dementia: the effects of some can be reversed; those of others, currently, cannot. For those people with a progressive type of dementia, specialized care in specialized environments is required to enhance their abilities and quality of life.

This guide sets out to increase public awareness of new housing options for people with dementia and to encourage the development of more community-based solutions. More specifically:

- it describes a range of housing options designed to meet the particular needs of people with dementia;
- it outlines a range of support services that can help caregivers to fulfil their responsibilities;
- it discusses a number of housing management principles that can help in the care of people with dementia; and
- it discusses environmental design considerations for housing people with dementia.

One of the important concepts presented in this guide is that of "residentiality". Very simply, this concerns the importance of creating a home-like setting for those suffering from dementia. The guide discusses two primary options for those suffering from dementia - to remain at home (whether that is a detached suburban bungalow, a condominium apartment or a dwelling unit in a retirement community), or to move into housing specifically designed for people with dementia. For those who can no longer remain at home, the guide presents a number of housing options where persons with dementia can maintain a comfortable sense of living normally.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

*Order number: NE2214 **Price: $24.95 + GST and handling charges.*

NOTE : Aussi disponible en français sous le titre : Les choix de logements pour les personnes atteintes de démence

AVAILABILITY : CMHC Information Products

IMPORTANCE DU RISQUE ENVIRONNEMENTAL DOMICILIAIRE DANS LA SURVENUE DES CHUTES CHEZ LES PERSONNES ÂGÉES

Research done in recent years has shown that falls by the elderly are not due to chance and are attributable to a combination of factors pertaining to their physical and psychological state, their behaviour and their physical environment. Contrary to intrinsic factors, the environmental component in the risk of falls, though frequently cited as a contributing cause, has been investigated far less. According to studies published in the past twenty years, it has been estimated that the physical environment accounts for close to one half of the falls which occur in the home. The establishment of an environmental risk level pertaining to elders represents a crucial point in preventing falls. In this study, four objectives were pursued:

- List in order the environmental risk factors which relate to falls based on the opinions of a group of experts;
- Determine the level of environmental risk encountered on a daily basis by the elderly living in their homes;
- Identify high-risk sectors in homes;
- Estimate the correlation between the level of environmental risk and the occurrence of falls.

This study examined residents in the Quebec urban region 65 and over, who are autonomous, active and living in their homes. To ensure a homogeneous sample, participants in the study did not require help to move about (walkers and wheelchairs). Two hundred and eleven appointments were scheduled and 192 visits were made between July 21 and October 6, 1997. The information was essentially collected from two measuring instruments completed by interviewers when they visited, i.e., a checklist of environmental risk elements and a questionnaire dealing with the respondent's characteristics (sociodemographic data, whether they have fallen and their history of falling, the level of activity in the home).

Using a linear measuring scale, a group of experts listed in order the various environmental risk factors. This group consisted of 24 persons and covered three specific areas of interest - health, architecture and retired persons. The respondent had to rate each risk factor by choosing a figure on a linear scale to indicate the importance of the factor.

Prepared by Benoît Lévesque, Isabelle Lamontagne, Pierre Maurice, René Verreault, Suzanne Gingras and Denis Gauvin. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

MEETING SENIORS' HOUSING NEEDS: A GUIDE FOR COMMUNITY GROUPS

The purpose of this guide is to help seniors' organizations throughout Canada understand how they can influence the provision of seniors' housing in their communities. This guide is intended to help organizations of all types and backgrounds, from the brand new to the old hands. Its contents are based, in part, on input received from seniors' organizations all across the country, including some which have developed dozens of housing projects, some working on their first, and some making their contribution in other ways.

The guide is divided into three parts.

Part 1 - An Overview of Seniors' Housing describes seniors' housing preferences and options, as well as an overview of the way seniors' housing is developed and managed in Canada.

Part 2 - A Framework for Action will help a group get organized, provides some advice on understanding housing needs in a community and gives a few suggestions about how community groups can raise funds to help finance their activities.

Part 3 - Ideas for Action reviews three broad approaches to meeting seniors' housing needs that could be used by community groups throughout Canada.

The guide also contains an annotated bibliography and a list of useful contacts that will help organizations quickly find more information.

Prepared by Kathleen Mancer and Donna Kosmuk, DKM Housing Consultants, with research assistance provided by Anglais et associés. CMHC Project Manager: Steven Mennill. Ottawa: Canada Mortgage and Housing Corporation, 1999. (Distinct Housing Needs Series; Research Report) 43 pages

Order number: PE0350

NOTE: Aussi disponible en français sous le titre : Répondre aux besoins en logement des personnes âgées : Guide pour les groupes communautaires, PF0350

AVAILABILITY : CMHC Information Products

SUPPORTIVE HOUSING FOR SENIORS

Supportive Housing for Seniors describes the concept of supportive housing, discusses how it works, who can benefit from it, what types of supportive housing options can be made available and how these can be developed. It contains over 100 photographs, floor plans and charts, and features ten examples of supportive housing projects from across Canada. It also contains a list of additional examples of supportive housing, and a set of extensive end notes which draw on the most recent and relevant sources in Canada and the US.

As more and more Canadians live longer and healthier lives, a large and growing market for housing geared specifically to older seniors (75+) is emerging. Supportive Housing for Seniors is designed to help the housing and support service industries develop an appropriate range of housing options for this unique segment of the population.

Prepared by Social Data Research Ltd. CMHC Project Officer: Luis Rodriguez. Ottawa: Canada Mortgage and Housing Corporation, 2000. (Distinct Housing Needs Series Research Report) 49 pages

Order Number: PE0381

NOTE : Aussi disponible en français sous le titre : Le logement-services pour les aînés

AVAILABILITY : CMHC Information Products

VIVRE À DOMICILE OU EN RÉSIDENCES PRIVÉES : UN DÉFI POUR LES AÎNÉS ET LES INTERVENANTS

In recent decades, Quebec, like Canada, has been confronted with a new and preoccupying reality: the rapid aging of its population. Current governments are opting for a reduction in institutional accommodation for seniors, in line with their rationalization objective. They are consequently gearing their policies and programs to greater responsibility on the part of the community and private retirement housing sectors. This deinstitutionalization represents, in many respects, a sizable challenge for managers and workers in the retirement housing sector, both regionally and nationally.

In fact, the expansion of the private retirement housing and home care sectors and the situation of the workers in these sectors are exposed to many risks. Among other things, the tendency towards heavier workloads caused aging clients, inadequate working conditions, insufficient internal and external resources, profitability and competitiveness objectives and lack of training and support are factors that could greatly affect the day-to-day work of the staff and the operations of the organizations. In addition, these threats could compromise the safety and protection of older clients, and promote the negligence and exploitation of these clients.

This research project studies the restrictions and difficulties encountered by staff working in the private retirement housing sector within the Saguenay area and in community home care organizations, and then takes into consideration the viewpoint of seniors who use these types of resources. The results obtained allow for an identification of the barriers and limits faced by managers and staff working with independent and semi-independent seniors. The training needs of these workers from the perspective of meeting all the needs and expectations of the seniors whom they deal with are also covered by this research.

Principal Investigators: Danielle Maltais and Suzie Robichaud. Research Assistants: Anne Simard, Martin Truchon, Alain Girard. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

SOCIAL HOUSING

EVALUATION OF THE URBAN SOCIAL HOUSING PROGRAMS

The Evaluation of the Urban Social Housing Programs by Canada Mortgage and Housing Corporation (CMHC) covers the Non-profit, Rent Supplement and Urban Native Housing Programs delivered since 1973. These programs were the main elements of the urban social housing strategy introduced by the Federal Government in 1985. The evaluation focused on the programs delivered between 1986 and 1993, but also covered other versions delivered prior to 1986. While new commitments under these programs were terminated in 1993, subsidies continue to be provided to the portfolio of existing projects. Note that the Residential Rehabilitation Assistance Program (RRAP), co-operative housing projects and special purpose housing projects were part of the 1986 urban social housing strategy, but were not included in this evaluation. The Public Housing and Limited Dividend Housing Programs were also not included in this evaluation, nor were any unilateral provincial housing programs.

The evaluation report provide descriptions of the programs and evaluates the success of the following:

- client targeting;- impacts on housing situation, quality of life, social and economic well being;
- current housing situation and client satisfaction;- management effectiveness.

Finally, the report comments on the Non-profit and Urban Native Project costs and examines the cost effectiveness of the Non-Profit Program relative to the Rent Supplement Program.

Prepared by: Audit and Evaluation Services, Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1999.
NOTE : Aussi disponible en français sous le titre : Évaluation des programmes de logement social en milieu urbain

AVAILABILITY : Canadian Housing Information Centre

DEFINITELY IN MY BACKYARD: MAKING THE BEST CHOICES FOR YOU AND THE ENVIRONMENT

This brochure compares the maintenance of seven different kinds of garden, each with different requirements in terms of time, cost, water, fuel, fertilizers and pesticides. The gardens evaluated are: Xeriscapes; Woodland shade gardens; Wildflower meadows; Conventional lawns; Low-maintenance lawns; Ornamental trees and shrubs; and Ornamental flower beds. Includes coloured illustrations and graphs.

Ottawa: Canada Mortgage and Housing Corporation, 2000. 8 pages

Order number: NHA 2502

NOTE : Aussi disponible en français sous le titre : Vraiment dans ma cour : prendre les meilleures décisions pour vous et pour l'environnement

AVAILABILITY : Canadian Housing Information Centre

DEVELOPING CONSUMER INFORMATION ON SUSTAINABLE COMMUNITY PLANNING

This report presents key considerations for the development, marketing and distribution of consumer-oriented information materials focusing on those community planning elements over which consumers have direct influence. This study was commissioned to determine a strategy for developing, marketing and distributing proposed products in this area, but the lessons learned from the research can be useful to other housing stakeholders.

The information and conclusions are based on research consisting of:

- a literature review and six in-depth interviews to provide insight into key concerns and directions for the study;
- a full-day, brainstorming session with housing researchers to determine priority topic areas, goals, target audiences and five product concepts to be tested;
- 12 consumer focus groups held across Canada; and
- 30 in-depth interviews with potential clients/partners.

The study found:

- Awareness of sustainable community planning issues is low among consumers. The environmental dimension of community planning is not clear to them. Neither are the benefits of sustainable communities. At the same time, many consumers find sustainable community planning to be an intriguing concept. Of the various sustainable community topics, sustainable landscaping sparks consumer interest the most. Consumers appear to be the least receptive to compact communities.

- Information on this topic should focus on those aspects that make communities great places to live. Great livability should be the one overriding impression that consumers are left with regarding these communities. Specifically, information materials should stress the human dimension of sustainable communities and the potential personal benefits that resonate most strongly with consumers: community interaction and dialogue with neighbours, access, convenience, safety, affordability, recreational opportunities and so forth.

- Finally, the information materials should also highlight the notion of options (and longevity) within the community, that is, that a variety of housing choices are available to accommodate the needs of a range of lifestyles and life cycles.

Prepared by Cullbridge Marketing and Communications & GLPI for Canada Mortgage and Housing Corporation. Ottawa: CMHC, c1999.

Order number: PE 0339

NOTE : Aussi disponible en français sous le titre : Élaboration d'une base de renseignements sur la planification de collectivités durables à l'intention des consommateurs, PF 0339

AVAILABILITY : CMHC Information Products

RESIDENTIAL LANDSCAPES: COMPARISON OF MAINTENANCE COSTS, TIME AND RESOURCES

Many homeowners have in recent years become increasingly aware of the potential impacts landscape maintenance can have on the environment. Consequently, many are now looking for ways to maintain attractive and functional residential landscapes while reducing the potential for environmental impacts in their yards, as well as saving costs and time by adopting low-maintenance landscape options. However, assertions about the time and cost savings and environmental benefits of the low-maintenance alternatives have not been substantiated with observed data collected from Canadian homes. The purpose of this report is to begin the process of filling this gap, by comparing the various cost, material and time inputs associated with the maintenance of seven residential landscape types, both conventional and alternative. As well, the report includes an overview of the potential environmental impacts and benefits related to these seven landscape types and their maintenance.

Conventional landscape types reviewed in this study include: conventional lawns; ornamental trees and shrubs; and ornamental flowerbeds.

Alternative landscapes in this study include: xeriscapes; woodland shade gardens; wildflower meadows; and low-maintenance lawns.

Prepared by Ecological Outlook. CMHC Project Officer: Susan Fisher. Ottawa: Canada Mortgage and Housing Corporation, 2000.

AVAILABILITY : Canadian Housing Information Centre

RYDER LAKE "URBAN VILLAGE": DEVELOPMENT PLAN FOR A SUSTAINABLE COMMUNITY = LE VILLAGE URBAIN DE RYDER LAKE : PLAN D'AMÉNAGEMENT POUR UNE COLLECTIVITÉ DURABLE

Chilliwack, a community of sixty-five thousand located in British Columbia's Lower Mainland region, has responded to the challenge of accommodating a fast-growing population in an environmentally responsible manner by launching a project to build a sustainable community or "urban village" on 2,500 hectares in the adjacent hillside area of Ryder Lake. Recognizing the groundbreaking nature of such an initiative, in fall 1994, the AsCsT Program awarded the District of Chilliwack's Municipal Development Department a grant to be used towards the preparation of a plan, including development policies, standards and guidelines, for a high-density, compact community of approximately 40,000 people. A related goal of this project was to create an efficient approvals process for permit applications for development in Ryder Lake.

This AsCsT project resulted in the preparation of the Ryder Lake Area Plan ("The Plan"). The Plan proposes the use of a combination of flexible regulatory tools to guide the development of the Ryder Lake sustainable community. As a starting point, the District designated the entire Ryder Lake area as a "Development Permit Area" under the Municipal Act. This approach allows the District to protect the natural environment and to establish guidelines regarding the form and character of commercial and multi-family development. Furthermore, construction in Ryder Lake will be regulated by the application of performance standards rather than conventional prescriptive standards which are typically used to control suburban development. By focusing on the objectives and intent of the design, performance standards provide municipal authorities with an acceptable amount of control over the development process while, at the same time, enabling developers to build in a more creative manner.

The goals of the AsCsT Program - improving housing affordability, choice and quality through regulatory change - are clearly reflected in the development of sustainable communities such as Ryder Lake. The results of this project are very much applicable to other communities wishing to plan growth and development in a way that enriches the lives of its citizens while respecting the environment.

Affordability and Choice Today (A.C.T.) Demonstration Project / District of Chilliwack, British Columbia. Prepared by Julie Tasker-Brown. Prepared for: Federation of Canadian Municipalities, Canadian Home Builders' Association, Canadian Housing and Renewal Association, Canada Mortgage and Housing Corporation. Ottawa: The Federation; The Associations; CMHC, 1998.

AVAILABILITY : Canadian Housing Information Centre

SOUTHEAST FALSE CREEK DESIGN CHARRETTE: EXPLORING HIGH DENSITY, SUSTAINABLE URBAN DEVELOPMENT

The Southeast False Creek (SEFC) sustainable neighbourhood planning project is an initiative to redevelop approximately 32 hectares (79 acres) of industrial land on the False Creek waterfront, in the downtown of the city of Vancouver, as a residential neighbourhood for between 8,000 and 10,000 people. Southeast False Creek is being designed to embody the principles of sustainable development in a manner appropriate to the scale, location, context, opportunities and constraints of the site.

This report summarizes the results of a design charrette partially funded by Canada Mortgage and Housing Corporation (CMHC), in partnership with the City of Vancouver, held in October 1998, to explore the implications of sustainable guidelines and separate policies proposed for the SEFC, particularly about 19 hectares (47 acres) of city-owned land within the 32-hectare (79 acre) study area. A core principle in the planning of the SEFC is that it should be a transferable model of high-density sustainable urban development.

This report includes a brief history of the guideline development, the reasons for holding a charrette, a synopsis of CMHC research that was used, a critique of the effectiveness and value of the charrette. The report also includes drawings done at the charrette itself.

Prepared by Dianne Perrier, Mark Holland, Fiona Crofton. Prepared for Canada Mortgage and Housing Corporation. CMHC Project Officer: Doug Pollard. Ottawa: CMHC, c2000 (Healthy Housing and Communities Series) xiv, 103 pages.

NOTE : Aussi disponible en français sous le titre : Charrette de conception pour le secteur Southeast False Creek

AVAILABILITY : Canadian Housing Information Centre

SUSTAINABLE APPROACH TO SUBURBAN DEVELOPMENT IN KOREA: A DEMONSTRATION IN THE SOODONG VALLEY

This document presents a step by step planning process for helping Korea move towards sustainability. This report describes a sustainable approach to suburban housing. it includes a planning framework intended for use by developers of garden-style housing anywhere in the country. It also includes a case study in which the planning framework has been used to create a concept plan. The case study includes planning and construction guidelines for a proposed 100-unit housing development in the Soodong Valley, northeast of Seoul. It is hoped that the examples presented will provide guidance to the Korean housing industry on how to construct garden-style housing in a manner that is sensitive to the environment, appropriate to the needs of the Korean populace, and representative of the best Canadian building and planning expertise. The project has been jointly sponsored by Canada Mortgage and Housing Corporation (CMHC), and by the Korea Housing Institute (KHI). The proposed demonstration site is owned by a Lifecare Consulting Co. Ltd., a company owned by Mr. Jin H. Kim, a Korean-Canadian architect. Mr. Kim operates a small college in Seoul where he teaches wood frame housing design. He participated in the project as an advisor to KHI, and has contributed many suggestions useful in the preparation of the concept plan for the site.

Prepared by the Sheltair Group Inc. and Ramsay Worden Architects Ltd. Prepared for Canada Mortgage and Housing Corporation and Korea Housing Institute. CMHC Project Officers: Jay Thakar and Murray Rasmusson. Ottawa: CMHC, 1999.

NOTE: Issued in English and in Korean

AVAILABILITY : NOTE: Available on a loan basis only from:
Canadian Housing Information Centre

SUSTAINABLE COMMUNITY DESIGN

This project sought to identify the features of a sustainable community and how they can be applied to the design of a new community. Several Canadian and international examples of built or proposed communities were used to seek out theses features. It also tried to test consumer response to these design features by using images and facts from these example case studies and from a proposed design for a Canadian subdivision.

The study results are incorporated in a CD-ROM. It presents 150 sustainability features organized in distinct categories ranging from the house scale to the large community level. Text and images describe each feature and its effect on sustainability. All features are linked to a set of case studies where they are shown with pictures, drawings or diagrams. A list of references supports each aspect of community design along with Internet connections to many original sources. This component of the disc provides an extensive and comprehensive check list of all the elements that need to be considered in the design of a sustainable community. The visual descriptions of these elements would assist a designer in setting a starting point for a planned new community.

Visualizing the attributes of a sustainable community can also help gauge consumer reaction. The disc includes a complete questionnaire, in a sequence of electronic images, that can be used as a means of exploring the market for innovative features which cannot be found and experienced in real life settings.

Prepared by Eduard Epp, Richard Perron, William T. Perks, Chris Sale, David van Vliet.
Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

NOTE: CD-ROM available on an interlibrary loan basis only.

AVAILABILITY : Interlibrary Loans, Canadian Housing Information Centre

WORLD'S BEST HOMES: GETTING BETTER ALL THE TIME

This free brochure encourages adoption of Healthy Housing principles, promotes CMHC Healthy Housing research, introduces the concept of FlexHousingTM and increases awareness of CMHC products and services.

Ottawa: Canada Mortgage and Housing Corporation, 2000. 8 pages

Order number: NE2382

NOTE : Aussi disponible en français sous le titre : Les meilleurs habitations au monde.

AVAILABILITY : Canadian Housing Information Centre

IMPACT OF URBAN FORM AND TRAVEL ACCESSIBILITY ON PRIVATE VEHICLE USE: SUMMARY

The purpose of this study is to measure the influence of land use patterns and urban form on household travel demand and behaviour. Using household travel survey data from the City of Edmonton, multiple regression analyses were conducted to examine the influence of factors such as: household income and size; accessibility measures by walk, cycle, transit and auto; density and road patterns.

While this study shows that automobile use is largely influenced by factors beyond the 'reach' of planners and engineers, it also indicates that measures that improve walk, transit and bike accessibility and that reduce auto-accessibility can result in substantial reductions in household automobile use. The influence is greatest when these measures are applied in combination.

Prepared by Hunt Analytics Incorporated. Prepared for Research Division, Canada Mortgage and Housing Corporation; Health Canada; Environment Canada. CMHC Project Manager: Susan Fisher. Ottawa: CMHC, 1999. (Healthy Housing and Community Series; Research Report)

Order number: PE0342

NOTE : Aussi disponible en français sous le titre : Incidence de l'aménagement urbain et de l'accessibilité du transport sur l'utilisation de la voiture particulière.

AVAILABILITY : CMHC Information Products

WATER CONSERVATION, REUSE & MANAGEMENT

CASE STUDIES OF POTENTIAL APPLICATIONS OF INNOVATIVE RESIDENTIAL WATER AND WASTEWATER TECHNOLOGIES

Objectives of this project were to identify and describe opportunities for use of innovative water supply and wastewater systems for residential buildings, to compare costs and benefits of traditional and innovative systems, and to propose solutions that could lead to more cost-effective and environmentally friendly housing. The innovative technologies considered are those used in the Toronto Healthy House: a rainwater cistern system, and recycling of all household wastewater, for non-potable uses. In five case study sites in Nova Scotia, life cycle costs of these technologies were compared with costs of traditional infrastructure alternatives -- municipal water and wastewater, or wells and on-site sewage disposal systems. These comparisons indicate that the Healthy House technologies could be cost-competitive in an urban or suburban subdivision if fire protection is not required; a non-urban area as an alternative to a cluster system, or in a non-urban area as an alternative to a remedial central system. Other situations where they might be appropriate are also discussed. Other non-cost issues -- technological, management, regulatory, and public and political -- that must be considered if these technologies are to be adopted are identified and discussed. Recommendations are offered about strategies and actions that can take advantage of opportunities and address problems and issues related to adoption of innovative technologies for residential water supply and wastewater management.

Prepared by D.H. Waller, M.A. Salah, Centre for Water Resources Studies, DalTech. CMHC Project Officers: Peter Russell, Stéphanie McFadyen. Ottawa: Canada Mortgage and Housing Corporation, 1999. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

SUSTAINABLE HOME WATER SYSTEM AT THE ALBERTA SUSTAINABLE HOME/OFFICE

The objectives of the Sustainable Home Water System (SHWS) project were:

- to design an autonomous home water system which includes a rainwater collection, storage, and treatment system; greywater heat recovery; and a greywater treatment and recycling system;
- to install the SHWS at the Alberta Sustainable House as a demonstration prototype;
- to monitor and evaluate the performance of the SHWS and greywater heat exchangers; and
- to determine the SHWS viability in the Canadian housing industry as a retrofit and for new home installations.

The Sustainable Home Water System (SHWS) at the Alberta Sustainable Home/Office reduces total residential water use by 78% compared with average Calgary households.

Collected rainwater is treated on demand to satisfy potable water requirements and meets Canadian Drinking Water Quality Guidelines (1996) for all parameters tested, however aesthetic objectives are slightly exceeded for temperature.

Heat from greywater is reclaimed through the counter current and drum storage greywater heat exchangers contributing 7.4% and 4.4% respectively to hot water heating. In-series operation accounts for 16.8% of the hot water heating required at the ASH home/office.

The greywater is treated using slow sand filters, soil box subirrigation, and a Greywater Garden Wall. The treated greywater conforms to non-potable water guidelines from several US states, apart from the elevated levels of total suspended solids. This reuse water satisfies 86% of the total ASH home/office water demand (i.e. ultra low flush toilet, bathing, clothes washing, and subsurface irrigation).

The Sustainable Home Water System is a cost-effective, environmentally-friendly, safe home water system which can easily be installed in new homes, and SHWS components can be incorporated into existing residential water systems. Maintenance and operation requirements are inexpensive and require limited time, however, a complete understanding of the system is required. Further research, monitoring, and adaptations to the water treatment system will be continued to improve the SHWS.

Prepared by Jorg Ostrowski and Karen Braun, A.C.E. - Alternative & Conservation Energies, Inc. CMHC Project Officer: Stéphanie McFadyen. Ottawa: Canada Mortgage and Housing Corporation, 1998. (Housing Technology Incentives Program)

AVAILABILITY : Canadian Housing Information Centre

WATER QUALITY GUIDELINE AND WATER MONITORING TOOLS FOR RESIDENTIAL WATER REUSE SYSTEMS

This paper discusses the requirements for a monitoring and control protocol for small residential water reuse systems. It reports the findings of a workshop held with key personnel from health and environmental agencies: On-site Water Reuse in Canada - Ottawa '99 Protocol. The paper identifies and describes various monitoring parameters and control system components which are available and reviews their application in a residential water reuse system. The contents of this paper will be of particular interest to homeowners, property managers, consulting engineers and regulatory agencies wishing to assess available monitoring and control technologies and review the elements of a long-term monitoring and water quality control protocol.

Prepared by J. Stidwill and R. Dunn, totten sims hubicki associates. CMHC Project Officers: Cate Soroczan and Stéphanie McFadyen. Ottawa: Canada Mortgage and Housing Corporation, 1999. (Healthy Housing and Communities Series)

Order number: PE 0382

NOTE : Aussi disponible en français sous le titre : Lignes directrices sur la qualité de l"eau et outils de surveillance de l'eau pour les réseaux de réutilisation de l'eau dans les résidences

AVAILABILITY : CMHC Information Products

CANADIAN WOMEN AND THEIR HOUSING: 1997

The specific objective of this research study is to provide a profile and analysis of women, health and well-being related to housing issues in the 1990s. This report, building on and updating a 1983 report Women as Housing Consumers, is intended to provide information for use by academics, students, researchers, planners and housing policy-makers at municipal, provincial, and federal levels, and women generally. The study is also intended to suggest future directions for research, policy and dialogue with regards to healthy housing for women.

Prepared by: SPR Associates Inc. Prepared for Canada Mortgage and Housing Corporation. Ottawa: CMHC, 1998.(Housing Choices Series.)

Order Number PEO313

NOTE : Aussi disponible en français sous le titre : Les canadiennes et leur logement : 1997.

AVAILABILITY : CMHC Information Products

ENHANCING TRANSITION SHELTERS THROUGH RENOVATION: CASE STUDIES

The purpose of this research study was to explore issues facing transition shelters serving women and children from domestic violence situations when renovations to shelters are undertaken. Specifically, the research examined the effects of repairs and improvements to shelters funded through CMHC's Shelter Enhancement Program (SEP) through case studies of five shelters in the Lower Mainland and Vancouver Island of British Columbia.

The research included a focus group of women who use the shelters, key informant interviews with shelter staff, municipal officials and contractors, and site visits to the shelters. Case study summaries for each of the five shelters are included in the final report along with a discussion of the general themes and challenges associated with the renovation process.

The key findings are discussed related to six broad topics:

1. Safety and security2. Accessibility3. Client privacy and social needs4. Renovation processes5. Challenges in building renovation6. Funding mechanisms

The research study found that there are definite benefits to the shelters from the repairs and improvements including improved client services and improved housing conditions. In addition, the SEP serves as an important funding source which also contributes to the local economy. At the same time, shelters face challenges in carrying out renovation work. Shelter staff are often not 'experts' in building repairs and renovation, and the timing of the renovations may be challenging when the shelters must still continue to provide services to their clients. As well, the funding amounts available pose limitations on the work that can be undertaken. For example, shelter staff would like to improve the accessibility of their buildings for people with disabilities, but the types of renovations required would be very expensive. Finally, the report offers some suggestions for improvements in the funding approach that could be considered.

Prepared by: Cheryl Hall. CMHC Project Officer: Pat Streich. Ottawa: Canada Mortgage and Housing Corporation, 2000. (External Research Program)

AVAILABILITY : Canadian Housing Information Centre

** See Also: Women on the Rough Edge, p. 42

YOUTH AND HOUSING

HOUSING CANADA'S YOUTH

This research report reviews the main economic and sociocultural factors which encourage, facilitate or precipitate young people's departure from the parental home and some of the implications of these decisions. It discusses the questions of affordability, housing tenure, and satisfaction and aspirations of young people with regards to their housing. The problem of youth homelessness is discussed, including risk factors, housing-related strategies aimed at prevention, response to crisis situations, and possible resolutions.

This research report provides stakeholders with a picture of how Canadians under 30 years old are housed and an understanding of the major housing issues and options faced by Canada's youth.

Prepared by Damaris Rose, Jaël Mongeau, and Nathalie Chicoine. Ottawa: Canada Mortgage and Housing Corporation, 2000. (Distinct Housing Needs Series; Research Report) 68 pages

Order Number: PE0310

Note: Aussi disponible en français sous le titre : Le logement des jeunes au Canada

AVAILABILITY : CMHC Information Products

Y2K

PREPARING YOUR APARTMENT FOR Y2K. ABOUT YOUR HOUSE SERIES; CE 20

This guide has been prepared to provide you with the necessary information to assess the degree to which the Y2K problem could affect your apartment and building. This guide focuses on the appliances, equipment and systems which provide for your health, comfort and security: local utilities, electricity, water, fresh air, electronic access systems and heating. Information regarding consumer goods such as VCRs, camcorders, stereos, televisions, and home computers can be obtained directly from the manufacturer or the store where you bought them.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

NOTE : Aussi disponible en français sous le titre : Préparer votre appartement au passage à l'an 2000.

AVAILABILITY : Canadian Housing Information Centre

PREPARING YOUR HOME FOR Y2K. ABOUT YOUR HOUSE SERIES; CE 16

This guide has been prepared to provide you with the necessary information to assess the degree to which the Y2K problem could affect your home. This guide focuses on the appliances, equipment and systems which provide for your health and security: loss of electric power, loss of natural gas, loss of water supply, and communications. Information regarding consumer goods such as VCRs, camcorders, stereos, televisions and home computers can be obtained directly from the manufacturer or the store where you bought them.

Ottawa: Canada Mortgage and Housing Corporation, 1999.

NOTE : Aussi disponible en français sous le titre : Préparer votre habitation au passage à l'an 2000.

AVAILABILITY : Canadian Housing Information Centre

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